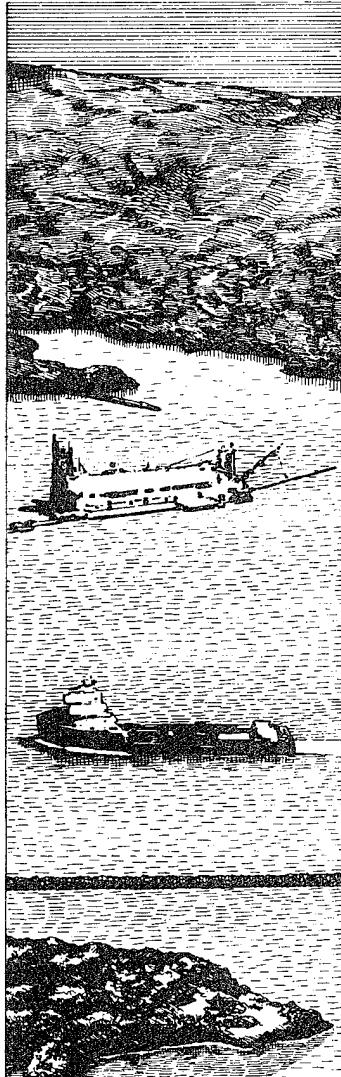




US Army Corps  
of Engineers



## DREDGING RESEARCH PROGRAM

### INSTRUCTION REPORT DRP-95-2

# SILENT INSPECTOR USER'S MANUAL

by

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October 1995

Approved For Public Release; Distribution Is Unlimited

19960116 058

Prepared for DEPARTMENT OF THE ARMY  
U.S. Army Corps of Engineers  
Washington, DC 20314-1000

Under Contract No. DACW39-92-D-0012

Monitored by U.S. Army Engineer Waterways Experiment Station  
3909 Halls Ferry Road, Vicksburg, Mississippi 39180-6199

The Dredging Research Program (DRP) is a seven-year program of the U.S. Army Corps of Engineers. DRP research is managed in these five technical areas:

- Area 1 - Analysis of Dredged Material Placed in Open Water
- Area 2 - Material Properties Related to Navigation and Dredging
- Area 3 - Dredge Plant Equipment and Systems Processes
- Area 4 - Vessel Positioning, Survey Controls, and Dredge Monitoring Systems
- Area 5 - Management of Dredging Projects

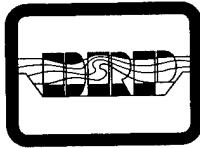
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# Dredging Research Program Report Summary



**US Army Corps  
of Engineers**

Waterways Experiment  
Station

## ***Silent Inspector (SI) User's Manual (IR DRP-95-2)***

**ISSUE:** Inspection of dredging operations can be greatly assisted by automatic logging of dredging activities and creation of dredging reports. This project has developed a system to assist inspectors in this capacity.

**RESEARCH:** A Dredging Operations Silent Inspector (SI) System to automatically log data from instruments generally maintained aboard hopper dredges, compute the dredging activities occurring and the quantity of material retained, and provide summaries of this information in both reports and graphical displays, has been developed. While the system is currently designed for use aboard hopper dredges, its basic concept will be applied to other dredge types in the future.

**SUMMARY:** This report describes how to

operate the SI system for hopper dredges assuming the system has already been installed by a systems engineer. A companion report entitled *Silent Inspector System Technical Manual* (in preparation) describes the internal operations and database structure of the system.

**AVAILABILITY OF REPORT:** The report is available through the Interlibrary Loan Service from the U.S. Army Engineer Waterways Experiment Station (WES) Library, telephone number (601) 634-2355. National Technical Information Service (NTIS) report numbers may be requested from WES Librarians.

To purchase a copy of the report, call NTIS at (703) 487-4780.

**About the Authors:** Mr. Jeffrey Cox, Evans-Hamilton, Inc., oversaw the team which developed the SI system, working under the direction of Mr. James Rosati, Prototype Measurements and Analysis Branch, Coastal Engineering Research Center, U.S. Army Engineer Waterways Experiment Station. Mr. Cox wrote the majority of the report. Mr. Paul Maresca, AdaSoft, Inc., led the system software development, and provided writing, technical guidance, and editing concerning the operating characteristics of the SI system. Ms. Andrea Jarvela, an independent technical editor and editor of the Marine Technology Society (MTS) Newsletter, assisted in the writing and technical editing of the report. For further information about the DRP, contact Mr. James Rosati at (601) 634-2202, or Mr. E. Clark McNair, Jr., Manager of the DRP, at (601) 634-2070.

# **Silent Inspector User's Manual**

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Approved for public release; distribution is unlimited

Prepared for U.S. Army Corps of Engineers  
Washington, DC 20314-1000

Under Contract No. DACW39-92-D-0012  
Delivery Order No. 0022

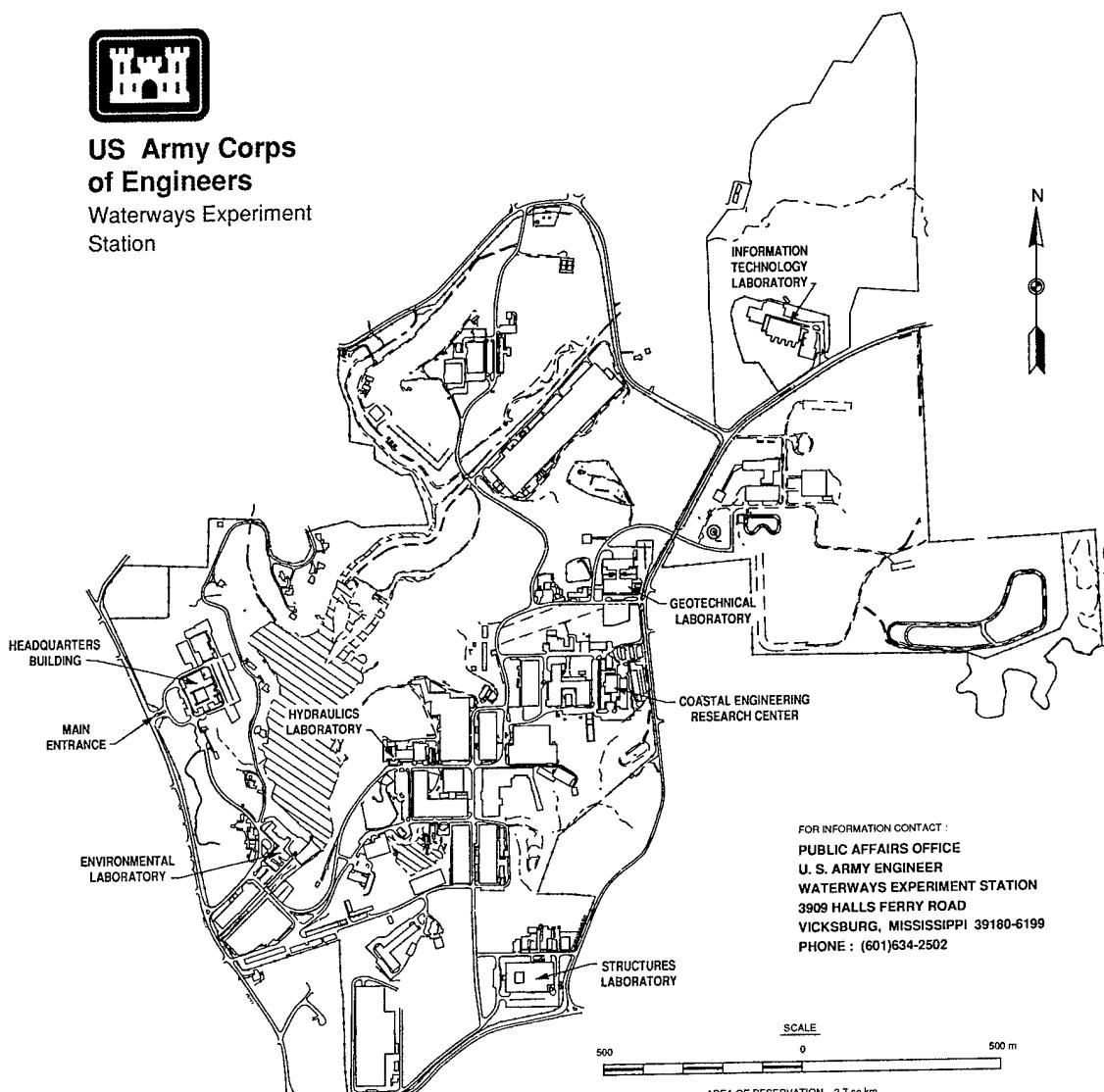
Monitored by U.S. Army Engineer Waterways Experiment Station  
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## US Army Corps

## of Engineers

Waterways Experiment  
Station



### Waterways Experiment Station Cataloging-in-Publication Data

Cox, Jeffrey M.

Silent inspector user's manual / by Jeffrey M. Cox, Paul Maresca, Andrea Jarvela ; prepared for U.S. Army Corps of Engineers ; monitored by U.S. Army Engineer Waterways Experiment Station.

118 p. : ill. ; 28 cm. -- (Instruction report ; DRP-95-2)

1. Dredging -- Management -- Computer programs. 2. Dredging spoil -- Measurement.

I. Maresca, Paul. II. Jarvela, Andrea. III. United States. Army. Corps of Engineers. IV. U.S. Army Engineer Waterways Experiment Station. V. Dredging Research Program (U.S.) VI. Series: Instruction report (U.S. Army Engineer Waterways Experiment Station) ; DRP-95-2.

TA7 W34i no.DRP-95-2

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# Preface

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This user's guide was prepared for the U.S. Army Engineer Waterways Experiment Station (WES) under Dredging Research Program (DRP) Technical Area 4, Work Unit No. 32482, "Silent Inspector." The DRP is sponsored by Headquarters, U.S. Army Corps of Engineers (HQUSACE). HQUSACE Technical Monitor for Technical Area 4 was Mr. M. K. Miles.

This user's guide was written by Mr. Jeffrey Cox, Evans-Hamilton, Inc., Seattle, WA; Mr. Paul Maresca, AdaSoft, Inc., Laurel, MD; and Ms. Andrea Jarvela, Seattle, WA. Technical oversight was provided by Mr. James Rosati, Principal Investigator, Prototype Measurements and Analysis Branch, Coastal Engineering Research Center (CERC), WES. Mr. E. Clark McNair, Jr., and Mr. Lyndell Z. Hales were Manager and Assistant Manager, respectively, of the DRP. Dr. James R. Houston and Mr. Charles C. Calhoun, Jr., were Director and Assistant Director, respectively, of CERC, which oversees the DRP.

At the time of publication of this report, Dr. Robert W. Whalin was Director of WES. COL Bruce K. Howard, EN, was Commander.

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# Summary

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This report describes the use of the Silent Inspector (SI) system developed for monitoring hopper dredge operations. The system collects and records measurements from shipboard sensors, calculates the dredging activities being performed and the weight of the material recovered in tons dry measure, and displays this information through standard reports and graphical data displays. Recorded data are also automatically backed up, and later archived to allow transfer of the data to other locations, and to provide a permanent record of the dredging activity.

The system operates on personal computers using the Unix operating system to allow multi-tasking operations, and consists of three primary components: a dredge-specific software component (DSS), a ship-based component (SHIP), and a shore-based component (SHORE). The DSS collects sensor data, checks these data against acceptable ranges, computes the status of the dredging pumps (on/off) and other equipment, attaches the name of the project and dredge, and the contract number to the data, and inserts these incoming data into the system's database. SHIP maintains the system's database, accepting data in real time from a DSS. SHIP then reviews those data, computes the present dredging activity being performed and the amount of material recovered, and produces reports (trip, daily, job) and graphical displays of the data. Additional information concerning the dredging project, the dredges used, and location of the dredging and disposal areas can also be inserted into the system database via the SHIP component. SHORE differs from the SHIP component in that it does not receive data in real time from a DSS unit. Its purpose is to provide in-office data review, display, and post-field processing.

Nearly all activities controlled by the user are done using graphical screens for ease of use and minimal training time. System security is maintained through use of user ID and password protection. The system's database structure and internal operations are described in a companion document, the *Silent Inspector System Technical Manual*.<sup>1</sup>

---

<sup>1</sup> Cox, J. M., Maresca, P., and Rosati, J. (1995). "Silent Inspector System Technical Manual," in preparation, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

# 1 Introduction

---

## Concept of the Silent Inspector System

The U.S. Army Corps of Engineers is responsible for the oversight or conduct of both new work and maintenance dredging throughout the United States. Over the past 150 years, the manner in which the Corps fulfilled this responsibility has changed. Prior to the 1970s, the Corps performed much of the maintenance dredging using a Corps-owned dredge fleet. Over the past two decades, the Corps of Engineers greatly reduced the number of dredges it owns and operates and the amount of dredging it performs with its own dredges, shifting the work to contractor dredges. This shift greatly increased the need for inspection of contractor dredging efforts to ensure adherence to contract specifications and requirements. As a result, the Corps of Engineers' main dredging focus changed from dredge owner and operator, to contract administrator and inspector of contractor dredging operations.

The Corps of Engineers' two primary methods of providing quality assurance and performance monitoring of contractor dredging have been to place federal dredging inspectors onboard the contractor dredges, and to conduct pre- and post-dredging bathymetric surveys. While these methods have worked well for many years in most cases, two recent changes have brought about the desire to develop better dredge operation inspection tools and documentation. First, increased environmental awareness has led to stricter standards for the regulation and monitoring of dredging operations, primarily in documenting the location of the dredge during both dredging operations and open-water disposal of the dredged materials. The position of the dredge during dredging and disposal operations must often be proven from recorded information.

Second, in the past few years budget cutbacks have reduced the number of personnel available for inspection of dredging activities, while the number of dredging contracts has increased. Irregular and seasonal dredging workloads have also made it difficult to provide an adequate number of trained inspectors on a timely basis. This resulted in some cases where the Corps relied solely on contractor-supplied information rather than on independently recorded information to determine the validity of contractor claims.

Concurrently, the progress of electronic instrumentation and data-logging systems made it possible to collect and preserve certain types of information with greater detail and accuracy than by hand. The concept of providing dredge inspectors an electronic tool for the automated collection, analysis, display, and

reporting of information about a dredge's activities was born from a combination of the above factors. This would allow inspectors and contract administrators to better assess contractor performance and adherence to contract terms, both when a dredge inspector was aboard the dredge and especially when an inspector was not aboard.

## **Dredging Operations Silent Inspector System**

The Dredging Operations Silent Inspector System, referred to as the Silent Inspector (SI), was created as a tool to assist Corps dredging inspectors in monitoring the performance of contracted hopper dredging operations on a 24-hr basis. Future versions of the SI are intended to adapt the system for use with other types of dredges. This manual describes the hopper dredge SI only.

The SI uses state-of-the-art computer hardware and software to simultaneously measure several parameters of the dredge's activities, display this information, automatically produce Corps dredging reports, and provide a permanent and transferable copy of this information. The SI strives to produce a factual record of the dredge's activities that is sufficient for dredging inspectors to accurately assess contract performance even in the absence of a full-time onboard inspector. To do this, the SI performs the following:

- Measures a suite of information about dredging activities that will enable the system and dredge inspectors to accurately assess the activities the dredge performed versus time and location, and assess adherence to contract requirements.
- Automatically creates dredging reports, such as trip (load), daily, and job reports, from the collected data.
- Measures, records, and reports dredging information in a standardized format for similar types of dredges to allow the data to be transferred easily between all Corps of Engineers Districts and offices.
- Provides a means to electronically archive the data collected and transfer them to users working on other hardware and software mediums.
- Provides graphical display of collected data by time or location.
- Provides a Corps-generated independent database of dredging activities for use in settling claims brought by contractors against the Corps.
- Provides flexibility and extendibility to meet changing system requirements, and to meet each District's unique system requirements.
- Allows Corps users to add individual features without destroying the integrity or operation of the basic system.

- Provides the Corps a more accurate assessment of dredging activities, downtime, and production rates for more accurate estimating of future project costs and budgets.

The SI has successfully undergone field tests on the Corps of Engineers dredge *Essayons*.

## About This Manual

This manual explains how to use the SI aboard hopper dredges. The remainder of this manual is organized into the following chapters:

- *System Overview*: Discusses the system's hardware/software components and overall capabilities of the system, including the types of data collected by the system, its data reporting and display capabilities, and its other features.
- *Getting Started*: Describes how the user interacts with the system through the use of graphical screens, mouse, and keyboard.
- *Operating the Training and Reference Dredge-Specific Software (DSS) Component*: Teaches how to start and operate the DSS component of the system, which gathers sensor measurements and inputs these data into the system database.
- *Operating the SHIP Component*: Teaches how to start and operate the heart of the system, and describes how the system collects, processes, reports, and displays collected data.
- *Operating the SHORE Component*: Teaches how to start and operate the shore-based unit, load data collected aboard dredges, and produce dredging reports and data displays.
- *Quick Reference*: Provides a condensed version of the commands and actions which operate the SI system.
- *Terms*: Provides a definition of terms related to both dredging and the SI used within this manual.

More detailed information on the system's internal software design and operations is contained in a separate manual, *Silent Inspector System Technical Manual*.<sup>1</sup>

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<sup>1</sup> *Ibid.*

## 2 System Overview

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The Silent Inspector (SI) system is designed to work on hopper dredges. This system is designed to accomplish the following:

- a. Record data on several aspects of dredging operations.
- b. Properly label the data with the project name, contract ID, dredge name, trip (load) number, and dredging and disposal locations.
- c. Compute the type of dredging activity occurring aboard the dredge at any time, and the amount of material recovered in terms of tons dry measure (TDM).
- d. Automatically provide summaries of the trip (load), daily, and job-to-date dredging activities on a similar basis to reports in use today.
- e. Graphically display recorded data.
- f. Archive the data for transfer to other SI systems, and for permanent record keeping.

This chapter provides an overview of how the SI is structured, and its capabilities at performing the functions listed above. The chapter is organized as follows:

- a. Hardware and software required.
- b. System operational components.
- c. System capabilities, including the following:
  1. User entry of project and dredge information.
  2. Measurements collected by system.
  3. Data calculations made by the system.
  4. Data reports generated by the system.
  5. Data display capabilities.
  6. System security.
  7. Data backup, archiving, and transfer capabilities.
  8. Data accessibility.

Appendix A is a glossary of terms related to dredging and the SI.

# Hardware and Software Requirements

This current version (Version 1.0) of the SI for hopper dredges operates on the Unix operating system, and 486 PCs. The system software has been designed to require minimal or no user knowledge of the Unix operating system or commercial software packages utilized within the system. User interactions with the system are via a graphical user interface that allows easy setup, operation, and data review.

System hardware and software will change over time. The present system utilizes the hardware and software listed below.

## System hardware

The SI hopper dredge system is designed to be used on personal computers (PCs) because they are commonly used throughout Corps of Engineers Districts. Communication between computers is based on Ethernet.

The system is composed of three components (DSS, SHIP, and SHORE), which are described in the following section. The following computer hardware is necessary for each component to ensure proper operation:

<i>Hardware</i>	<i>DSS</i>	<i>SHIP</i>	<i>SHORE</i>
486 PC with minimum of 33-mHz clock, VGA graphics, standard monitor, 500-MB hard drive, 32-MB RAM	X	X	X
Ethernet link	X	X	
Postscript laser printer		X	X
Streaming tape drive and tapes		X	X
Uninterruptable power supply	X	X	

## System software

The SI was developed using several commercial software packages. These packages provide the graphical user screens and database engine that the system is built on. Consequently, each component of the system needs to access these commercial packages to operate properly. The software packages listed below must be purchased and installed on the DSS, SHIP, and SHORE computers for the system to work.

### *Software*

SCO unix with open desktop

SL-GMS  
Sybase relational DMBS (2-8 users)

## System Operational Components

The SI is composed of three operational units, called components. These components are named:

Dredge-Specific Software component (DSS)  
Ship-based component (SHIP)  
Shore-based component (SHORE)

### Dredge-specific software component (DSS)

The SI is designed to accept specific types of data about hopper dredge operations into its central database. Each hopper dredge contains a different suite of instrument types and locations, calibrations, data formats, and types of data available; thus, actual sensor data have to be converted into engineering units, assessed for validity, and in some cases, additional information must be computed to provide the required data inputs into the central database. This is the role of the DSS component.

While the output of each DSS is identical, inputs to a DSS generally will vary from dredge to dredge; therefore, no two DSS units are expected to operate internally in exactly the same way. The DSS resides onboard the dredge. The DSS described herein was developed for the Training and Reference SI system for hopper dredges. This particular DSS software resides on the same computer as the SHIP component, but it can operate on a separate computer.

### Ship-based component (SHIP)

The SHIP component is the heart of the SI. Like the DSS, it resides onboard the dredge. Required measured data are received from the DSS and are inserted into the system's central database. The SHIP system also performs the following:

- a. Displays the incoming data in real time.
- b. Computes and records the current dredging operation, called the dredge state, as well as the amount of material retained (TDM).
- c. Automatically creates standard trip, daily, and job reports based on the recorded data.
- d. Graphically displays any measurement data contained within the database.

- e. Automatically backs up and archives data.
- f. Permits the user to input information concerning the dredging project, dredge, its crew, dredging and disposal areas, and local marine landmarks.

Data recorded by SHIP are then transferred to a SHORE unit to allow more detailed data analysis and intercomparison with data from other SHIP units.

### **Shore-based component (SHORE)**

The SHORE component is quite similar to SHIP, with the following exceptions:

- a. It does not contain real time data collection capability.
- b. It is able to input and review multiple dredging project data sets.

SHORE executes on shore-based computers and provides data manipulation and analysis, generates reports, and creates graphics using the same software suite as SHIP. The user interface is nearly identical to the ship-based user interface. The major difference is the absence of the data monitoring user interface screens.

Multiple SHIP data sets can be input into SHORE. Each remains unique based on the project name, contract ID, and dredge name assigned to the data.

## **System Capabilities**

### **User entry of project and dredge information**

Information related to a dredging project, including the dredge name and characteristics, crew, designated dredging and disposal areas, and landmarks related to the local marine waters, can be entered into the system by the user. This information is entered into the system through the system's setup module. Information the user can enter includes:

#### **Project data:**

- Project name
- Contract number (ID)
- Contractor name
- Corps of Engineers District name
- Project type: New work or maintenance
- Anticipated start/finish dates

#### **District data:**

- Corps of Engineers District names
- Abbreviations for the District names

**Dredge data:**

Dredge name  
Dredge owner name  
Dredge type  
Year built  
Vessel beam  
Vessel length  
Vessel dredge pumps horsepower  
Vessel displacement: Empty and full  
Vessel maximum speed: Empty and full  
Vessel draft: Fore and aft when empty and loaded  
Distance to draft sensors along vessel hull  
Hopper maximum capacity  
Distance in hopper to ullage sensors

**Crew members**

Name  
Rank  
Initials (ID)

**Dredging areas (Stations)**

Dredging area name  
x, y coordinates forming rectangle to represent the dredging area

**Disposal areas**

Disposal area name  
x, y coordinates forming rectangle to represent the disposal area

**Landmarks**

Landmark name  
x, y coordinates of landmark location

**Measurements collected by the system**

DSS is required to insert into the SHIP database a required set of data concerning the hopper dredge's operations. To do this, the DSS obtains data originating from many instrument systems aboard the dredge, attaches a data quality indicator to the data, and computes data values needed by SHIP that are not directly measured.

The following data are the required inputs from DSS into the SHIP database:

Measured Parameter	Units
Project name	
Contract ID	
Dredge name	
Date	mm/dd/yy
Time	hr:min:sec
Vessel speed	knots
Vessel heading	degrees
Vessel position (X coordinate)	feet
Vessel position (Y coordinate)	feet
Hopper door status	open or closed
Pump-out status	on or off
Vessel draft-aft	feet
Vessel draft-forward	feet
Water depth	feet below ship
Port suction pump	on or off
Port side material recovery	true or false

Port side drag head depth	feet below ship
Starboard suction pump	on or off
Starboard side material recovery	true or false
Starboard side drag head depth	feet below ship

## **Data calculations made within SHIP**

The SHIP unit computes two items: the dredging operation under way, called “dredge state,” and the tons dry measure (TDM) of material collected. It also sums the total time a dredge is operating in each dredge state for reporting within the system’s standard reports.

**Dredging state calculation.** The SHIP component software is designed to calculate the status of dredging operations for each new set of measured data it receives from the DSS every 10 sec. The system automatically calculates the dredge states (which are currently tracked by hand for Corps of Engineers’ projects), and total time spent performing each activity. It can then produce summaries (reports) of individual trips, days, and jobs that are identical to the current reporting requirements. The seven dredge states the system identifies are as follows:

- a.* Dredging.
- b.* Turning.
- c.* Sailing to dump (disposal) area.
- d.* Dumping.
- e.* Sailing to dredging area.
- f.* Downtime.
- g.* Pumping out material.

The information provided by the DSS to the SHIP unit, and the computational equations within SHIP, can determine most of the dredge states accurately and consistently. The two exceptions are turning and downtime. Turning (presently defined by the Corps of Engineers as turns between dredging cuts) is difficult to distinguish from sailing to dump, and sailing to dredging area. Downtime (as presently reported by the Corps of Engineers) cannot be distinguished from other non-dredging states based on sensor data alone. The system will also decide that the dredge is in a downtime state whenever key measured data are missing from a data set. For details concerning the present dredge state computations and limitations, see the system’s technical reference manual.

**Tons dry measure (TDM) of material recovered calculation.** SHIP calculates the tons dry measure (TDM) of material in the hopper based on measured data collected at the end of the last dumping event and data displayed on the Dredging Operations screen. A plot of TDM versus time from the end of the last dumping event is provided, with time along the x axis. This screen will scroll whenever the TDM plot reaches the right-hand side of the plot, so that the newly arriving information continues to be visible on the left-hand side of the plot. For details on how TDM is computed, see the system’s technical reference manual.

## Data reporting

The system provides reports which generally display the same information as is currently reported by hand for Corps of Engineers projects and contracts. Trip (load), daily, and job-to-date reports are available.

The system automatically generates the trip and daily reports at pre-determined intervals, and allows users to create them at any time. Job-to-date reports must be initiated by the user. Each of these reports has a predefined report format, which resembles the standard report formats required by the Corps of Engineers for hopper dredge operations. Examples of these system reports are found in Appendix B.

Because the system automatically computes the dredge's activities or "state" versus time, times of each dredge activity within a trip, day, and job are summarized. Customized reporting of the data contained within the system database is not yet implemented, but this feature is planned for future versions.

**Trip report.** The trip report breaks down into the time required for dredging, hauling to disposal area, disposing material, returning to the dredging area, turning, shore delivery, and downtime. It contains the project's contract number and name, dredge name, trip (load) number, start times and locations when the dredge changed activities (dredge states), along with specific information on the dredge's status such as the vessel's heading, speed, draft, and pump status. The time spent in each dredge state, along with the total trip time and TDM of material retained are computed and presented at the end of each trip report.

The trip report begins when the dredge starts its transit to a dredging area and ends when dumping of the dredged material is completed. When a trip covers portions of 2 days (i.e., begins at 2300 and ends at 0100), the trip information is covered in one report, **not** split into two trips.

**Daily report.** The daily report summarizes time spent in each dredge state for each trip conducted during a day. The total TDM of material per trip, per minute of pumping, and per elapsed minute are also presented. Each quantity presented is summed for the day, and an average per load is displayed. A breakdown of downtime events is presented for those downtime categories currently reported manually.

The daily report includes information from all trips that begin during the day of the report. For trips that last until the following day, the entire trip quantities of dredging activity times and material dredged are contained in the daily report corresponding to the start date of the trip.

**Job report.** The job report summarizes information contained in the daily reports over the life of the job through the end date specified by the user. The job report also presents project cost information so as to more clearly resemble the Form 27 in use today. However, this cost information is not automatically generated by the system. It must be entered by the user.

Information to generate the job report is maintained in the system at all times. However, printing of a job report must be initiated by the user. The report includes all trips, beginning with trip number 1 through the last completed trip for the end date of the report.

### **Data display**

Most of the data contained within the system's database can be plotted versus time for easier review. Data overlay capability exists for values with the same units of measure.

### **System security**

The SI has several security features built in to ensure the integrity of collected data, and to restrict use to authorized personnel. The primary security feature is password-controlled access to different levels of the system. For example, dredge personnel have access only into the data monitoring screen and review of downtime events, plus the ability to designate downtime events by cause and add related comments. Dredge inspectors will normally have full access to all user screens, data report and display functions, and data transfer and archiving operations. Dredge inspectors will not be able to modify the measured data in any way. Access to the system's software code and database language is limited to designated SI software maintenance personnel. Access to the various levels, with the exception of the system software and database code, is controlled by Corps of Engineers District personnel using the password feature.

System security also consists of assuring that data entered into the system are both accurate and consistent. The DSS portion of the system performs, at a minimum, range checks of incoming data to minimum and maximum acceptable values. A data status for each piece of data sent to the SHIP database is computed and tagged to that data. The SHIP portion of the system performs additional data consistency checks. However, only by inspector verification to test data accuracy, and the mandating of various dredge actions to test data consistency (hopper water fill tests, for example) before and during a dredging project, can data integrity be assured.

### **Data backup, archiving, and transfer**

To ensure that data are not lost during data collection due to a system failure or full disk, an automatic data backup and recovery feature is included in the system. This feature provides for periodic dumps of the entire contents of the central database. These dumps are nondestructive and can occur while normal database processing is in progress. In between these complete database dumps, log files of all database transactions that modify the database are maintained automatically.

If necessary, the data contained in the complete database dump file can be reloaded into the SI central database. This operation overwrites all data in the database, and should only be used when the main database has been lost or corrupted. After recovering the database from the dump file, the transaction log files are applied to the recovered database to bring it up-to-date.

Transferring data from the data collection site onboard a dredge to the District offices, or between offices, is performed using the data archive function. Archiving data converts the data into a transferable Unix file format and deletes the archived data from the database. The user must then copy these files to tape or other archival medium for transfer to shore, where the data can be reloaded into an SI shore-based system for data display and analysis. The backup and archival data files both have unique formats so that the data must be reloaded into and accessed via a Silent Inspector system.

### **Data accessibility**

Because the SI is built around the Sybase relational database software, there are many options for accessing and presenting the data contained within it. Versions of popular PC databases and spreadsheets that are currently used in Corps District offices can be used to examine and report data contained in the SI database. This is how custom graphics and reports are produced by users of the SI system. Standard reports are produced without the aid of these data access tools but, by definition, cannot be customized by the user.

The Sybase database supports several standards that enable connections between programs. These include the Open DataBase Connectivity (ODBC), the Remote Database Access (RDA), and the Structured Query Language (SQL) standards. Many applications also support the native Sybase Application Programming Interface (API). Since many popular applications support these standards in conjunction with a network interface, users of the SI can leverage their investment in existing tools with the capabilities of the SI system.

# 3 Getting Started

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## System Installation

This manual assumes that the SI system has already been installed aboard a dredge and is operational. Installation of the system will generally be performed by a system engineer.

## User Interface

The SI software is designed to require minimum training to start and operate. Upon turning on the DSS, SHIP, or SHORE computers, the user must log into the program as follows:

- a.* Turn on the computer.
- b.* On the first Unix screen, enter user ID following the Unix prompt **Logon:**
- c.* After the user ID is accepted, enter password following the Unix prompt **Password:**.

The current user ID and password are:

User ID = **dosis**  
Password = **adasoft**

The system allows for an unlimited number of user ID's, each having a separate password. User ID's and passwords are entered into the system by a system administrator, so be sure to check on the user ID and password currently in use for the SI. The system administrator assigns each user to one of several levels of access within the system. Typically dredge personnel will have access to only the real-time data display screen, and the downtime screens for entering downtime causes and comments. Corps of Engineers dredging inspectors will typically have access to all features of the system, but not to the system's database or files used in performing data quality checks. System administrators will have access to all working aspects of the system. System engineers have full access to the source code of the system.

Entering an approved Unix user ID and password causes the system's database within SHIP to become active, and the system user screens to appear. All user screens are based on a graphical interface. Each provides easy-to-use menus or icons, selection buttons, scrolling screens for lists, and mouse-driven selections by double clicking on selected items. Use of windows, menus, and icons allows for easy searching for desired system functions. The user initiates operations by pointing with the mouse and clicking or double clicking the left mouse button. Multiple system capabilities, such as data monitoring and plotting, can be opened and operating simultaneously.

Access to the primary capabilities of the system is usually performed by clicking on an icon (Figure 1).

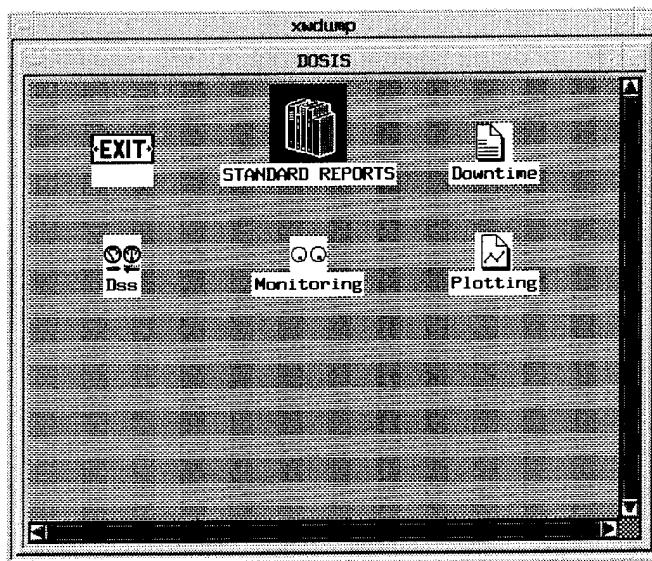


Figure 1. Main menu screen with icons to access system capabilities

The icons shown on this screen show the primary system functions accessible in this manner. Horizontal and vertical scroll buttons are provided to access icons which may not be visible when this screen is sized smaller.

The user may manipulate this screen in several ways. Clicking on the button in the upper left corner of the screen displays a menu that permits manipulation of the screen. Clicking on the left button in the upper right corner of the screen minimizes the screen down to an icon located at the bottom right side of the computer screen. The right-hand button in the upper right corner enlarges the screen. Clicking on the right button again restores the screen to its previous size. A screen may also be resized by placing the arrow on the lower right corner of the screen, clicking and holding down on the mouse key, and dragging the corner to a new desired location for the screen size of interest (this can be done on the sides or other corners, as well).

Pull-down buttons which cause lists of items to be displayed are used throughout the screens (Figure 2).

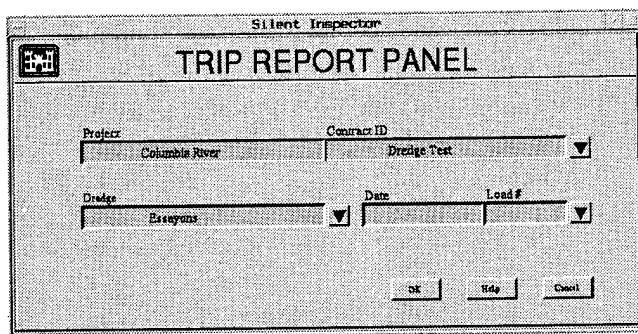


Figure 2. Screen showing pull-down buttons

Whenever only one data item resides within the database (for instance one dredge name) that data will be displayed in its information display box on a screen. Whenever more than one data item exists in the database, the information box will remain blank when the screen first appears. Clicking on the pull-down button to the right of the information box will cause a list of all such data items contained within the database to be displayed (Figure 3).

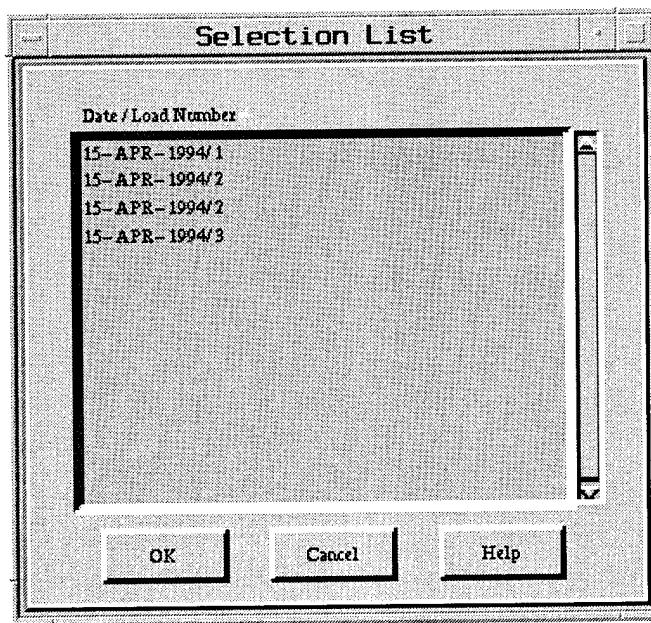


Figure 3. Typical selection list when multiple items reside within the database

Scroll buttons allow the list of items to scroll upwards or downwards. Clicking on the data item will select it within these screens. To enter the selected item in the information box on the previous screen, the user must click on the

**OK** button. Clicking on the **Cancel** button will cancel the selection, and return the user to the previous screen.

On all screens, any buttons displayed such as **OK**, **Cancel**, or **Help**, are used by placing the mouse arrow on the button, and clicking on the left mouse button.

Clicking on the **Cancel**, **Quit**, or **Exit** button always discontinues the operation being performed with a screen, and takes the user back to the previous screen. Only the **Exit** button on the system's main menu screen (Figure 1 above) will allow exiting from the Silent Inspector system and shut the system down.

Clicking on the **Help** button will provide access to the quick reference listings which are contained in this manual within Chapter 7.

The majority of the screens developed for the SI operate under the Unix operating system on the DSS, SHIP, and SHORE computers. Screens to perform user entry of information via the Setup function, and to access data within the database for display in DOS or Windows graphics packages or custom reporting tools, operate under Windows. These screens are accessed via a graphical menu system, but otherwise operate identical to the Unix-based screens.

You are now ready to start and operate the SI for hopper dredges.

## 4 Operating the Training and Reference DSS Component

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The DSS component of the Training and Reference SI system is located on the same computer that contains and operates the SHIP component. Both can operate simultaneously on the same computer or on separate computers. However, no data can be transferred from the DSS to the central database unless both components are operating.

### Starting DSS

To start the Training and Reference DSS:

- Turn on the SI computer containing the DSS and SHIP components. At this point the Unix software will begin operating, but the SI software will not yet be running. The SI software must be accessed using the following Unix log-on procedure.
- Type **dosis** (the present Unix user ID) in response to the Unix prompt **Logon:**.
- Type **adasoft** (the present Unix user password) in response to the Unix prompt **Password:**.

The user ID and password may be changed by the system administrator, as outlined in Chapter 3, so the user ID and password currently in use should be checked. Entering an approved Unix user ID and password causes the first SI screen to appear (Figure 4), and the system's central database within the SHIP component to become active.

The first screen of the SI allows the user to access either the User Manual on the computer, or the SI.

To begin operating the SI software, and access the system's main screen (Figure 5):

- Double click on the **DOSIS** icon on the first Silent Inspector screen.

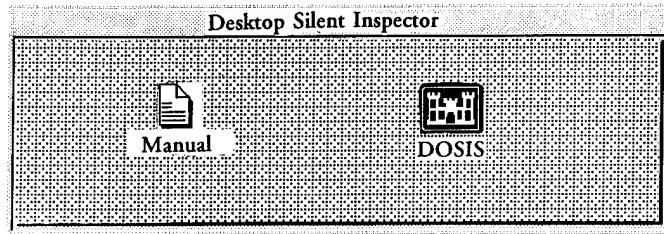


Figure 4. First screen of the SI system

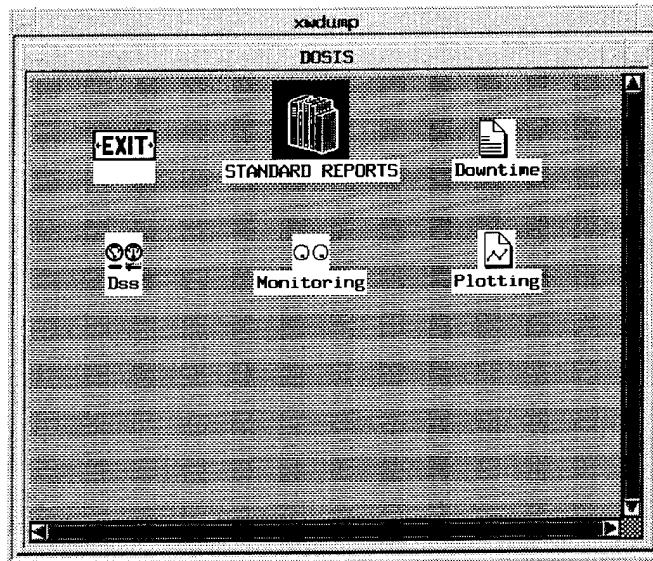


Figure 5. Main screen of the SI system

The main screen provides access to the DSS component, as well as all the major features of the SHIP component. To start the DSS component:

- Double click on the **DSS** icon.

The **DSS Entry Panel** screen (Figure 6) will appear. The DSS within the Training and Reference SI can accept data either in real-time from a working hopper dredge, or from previously recorded ASCII data files. As each DSS is generally created to accept data from specific hopper dredges, the recorded data must match the data content and format for the specific dredge for which the DSS was designed.

The **DSS Entry Panel** screen allows the user to select between accessing a recorded data file or real-time data. This screen also allows the user to tag incoming real-time or recorded data with the specific project and dredge name and contract ID for which it was collected, so as to provide the data with a unique set of identifiers within the SI system. To select the source of the incoming data (real-time or recorded data files):

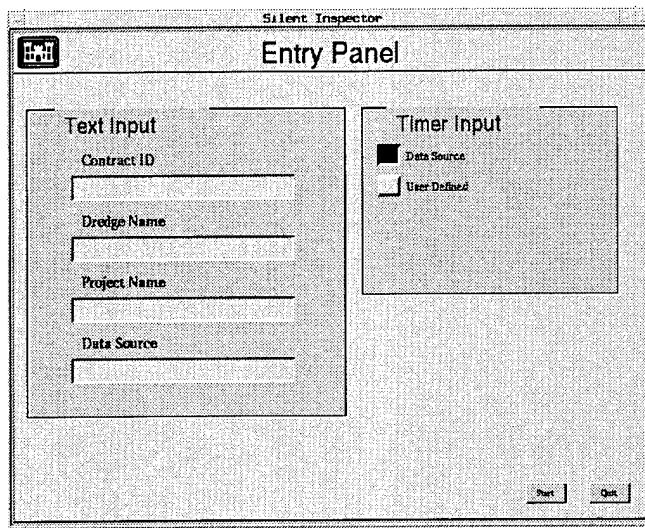


Figure 6. DSS **Entry Panel** screen

- Click on the **Data Source** box.
- If real-time data input into DSS is desired, ensure this box is blank, and press **RETURN**.
- If recorded data input into DSS is desired, enter the directory and file name of the recorded data, and press **RETURN**.

To enter the project and dredge names, and contract ID which will be added to the incoming real-time or recorded data:

- Click on the **Contract ID** box.
- Enter the contract number of the project.
- Click on the **Dredge Name** box.
- Enter the name of the dredge.
- Click on the **Project Name** box.
- Enter the name of the project.

To edit information in any of these boxes, simply click on the box and re-enter the information. The DSS will attach the entered information to the incoming data when it sends the data to the SHIP database.

Most incoming real-time or recorded data should contain a date and time associated with each set of measurements. The DSS **Entry Panel** screen allows the user to select whether the incoming date/time associated with the data is sent on with the data into the SHIP database, or whether the incoming date/time is

overwritten when entered into the SHIP database based on a time interval selected by the user. This feature was created primarily to allow more rapid testing of the Training and Reference SI and is not expected to be utilized in field-deployed units.

To have the DSS insert the data into the SHIP database with the same date/time as it entered the DSS from a real-time or recorded data source:

- Click on the **Data Source** button within the **Timer Input** section of the screen (see Figure 6).

To have the DSS insert the data into the SHIP database with a user-defined date/time (Figure 7):

- Click on the **User-Defined** button.
- Use the slide bar to set the update rate (in seconds).

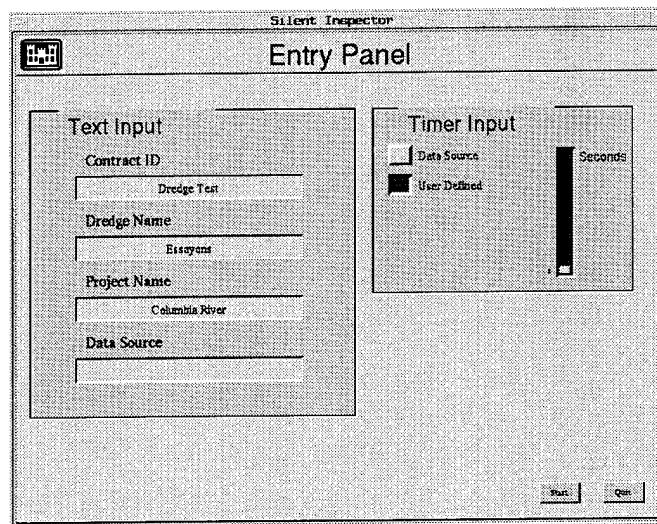


Figure 7. Setting a user-defined time interval

When the **User-Defined** button is selected, the DSS will tag the first set of measurements with the current time from the computer's internal clock. Each successive set of measurements will be tagged with a date/time which has been incremented from the previous date/time tag by the interval selected by the user. This computer-defined time will be entered into the SHIP database in place of the original date/time associated with the data.

When all selections are correct:

- Click on the **Start** button.

The DSS will now begin accepting data from either a real-time source or a recorded data file, as per the user selection, and entering this data into the SHIP database. The DSS accepts incoming data and transfers the data to the SHIP database as rapidly as it can. Real-time data transfer is limited by the intervals at which data are input into the DSS. Real-time data should be input into the DSS, processed, and entered into the SHIP database at no greater than 10-sec intervals.

## Running DSS

Clicking on the **Start** button on the DSS **Entry Panel** screen will both start DSS operating, and bring up the DSS **Control Panel** screen (Figure 8). The DSS begins actively looking for incoming data, compares these data to range limits established by the system administrator, and determines a data status for each data piece. Setting the range limits is described within the *SI Technical Reference Manual*. The DSS also attaches the project and dredge names, and contract ID to the data, and if selected by the user, a new date/time based on the user-selected time interval. The incoming data, their status versus the range limits, and the date, time, and dredge name attached to the data are all displayed on the DSS **Control Panel** screen.

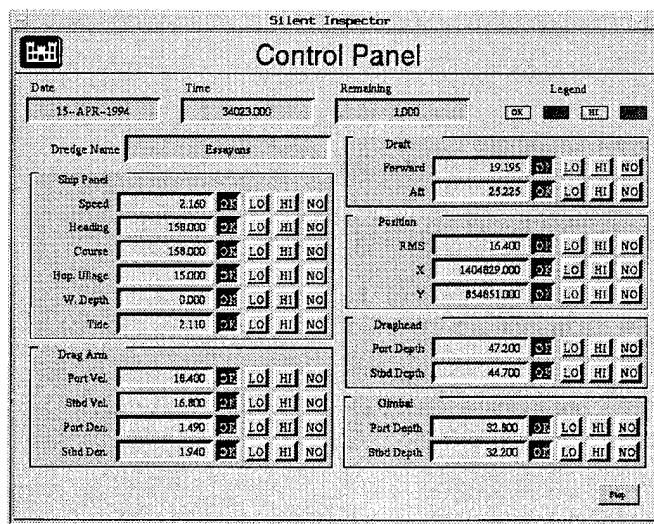


Figure 8. DSS **Control Panel** screen

To compute the data status for each data piece shown on this screen, the DSS compares the incoming data to minimum and maximum values entered into a range limits table by the system administrator, as mentioned above. Possible data status categories for incoming data can be OK, lower than the minimum, higher than the maximum, or no data present. The data status is displayed according to the legend in the upper right corner of the screen. A color representing the status of each data value is also present in the background of the data display boxes. The data status for each measurement is entered into the SHIP database along with the corresponding measurement data. All data

entering the DSS are passed on to the SHIP database without alteration, regardless of its data status.

The DSS for the Training and Reference SI can also be forced to send the SHIP database no data, or data out of range high or low, for selected measurements, rather than the incoming data it is receiving. This feature was implemented for purposes of testing the SI, and to determine its reactions to bad or missing data. This feature typically will not be present on field-deployed systems.

To force the DSS to send a no data status, or values out of range, for any measurement, click on the appropriate button next to each data display box (Figure 8). The button will then appear to be pushed down, and the data status indicator and color will change to match the button selected.

The DSS will continue operating until told to stop, or until the end of a designated recorded file is reached. To leave the DSS operating, and return to the system's main menu screen:

- Click on the **Minimize** button in the upper right-hand corner of the screen. This will close the screen and create a small icon with a DSS label in the lower right corner of the computer screen.

To stop the DSS from operating and return to the DSS **Entry Panel** screen:

- Click on the **Stop** button in the lower right corner of the DSS **Control Panel** screen.

If, after starting the DSS, the user wishes to alter the setup, the DSS must be stopped, the changes made, and then restarted. To do so:

- Click on the **Stop** button on the DSS **Control Panel** screen.
- On the DSS **Entry Panel** screen, click on the information box to be changed, enter the new information, and change the timer input source and interval as needed.
- Click on the **Start** button.

The DSS will now assign the newly entered information to the incoming data. The DSS **Control Panel** screen will again be displayed.

To exit the DSS program after the DSS operation has been stopped, and then return to the system's main menu screen:

- Click on the **Quit** button on the lower right corner of the DSS **Entry Panel** screen.

## 5 Operating the SHIP Component

## Starting SHIP

If the DSS and SHIP components are running on separate computers, the SHIP system should be running prior to starting the DSS so that the DSS can send data to the SHIP database. If the DSS and SHIP components are running on the same computer, as is the case with the Training and Reference SI, the SHIP system will always be started prior to starting the DSS. The SHIP system is effectively started by double clicking on the DOSIS icon (Figure 4) as described in Chapter 4. The DSS is then started by double clicking on its icon in the main screen (Figure 5 or Figure 9).

If the SI computer has already been turned on, and the DSS started, the SHIP system has effectively been started. The system's main menu will be displayed, and each of the SHIP component's modules can be accessed through their associated icons. Note that the SHIP system is already running as described above. If this is the case, skip to the "Setup" section within this chapter. If the SHIP computer has not yet been turned on, continue with the following instructions.

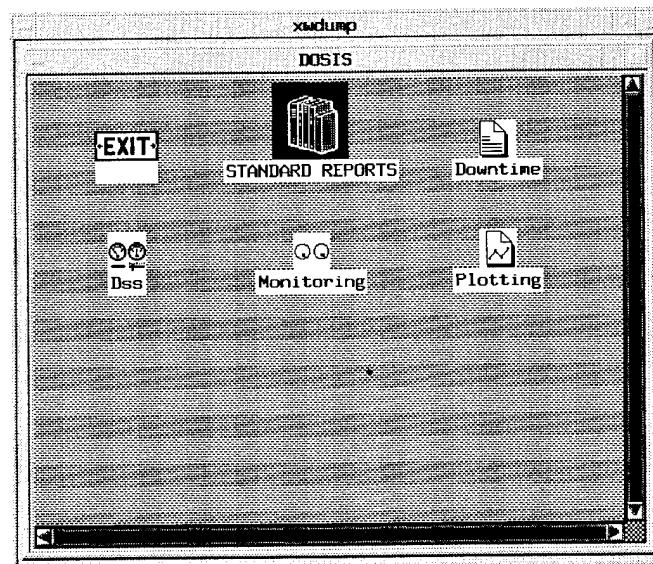


Figure 9. Main menu screen of the SI system

To start SHIP:

- Turn on the SI computer containing the DSS and SHIP components. At this point the Unix software will begin operating, but the SI software will not yet be running. The SI software must be accessed using the following Unix log-on procedure.
- Type **dosis** (the present Unix user ID) in response to the Unix prompt **Logon:**.
- Type **adasoft** (the present Unix user password) in response to the Unix prompt **Password:**.

As mentioned in Chapter 4, the user ID and password may be changed by the system administrator, so check the user ID and password currently in use. Entering an approved Unix user ID and password causes the first SI screen to appear (see Figure 4), and the system's database within the SHIP component to become active.

To access the system's main menu screen (Figure 9), and the SHIP component modules:

- Double click on the **DOSIS** icon on the first SI screen (see Figure 4).

The main menu screen provides access to modules for viewing data that are being entered into the database (**Monitoring** icon), producing reports from the database (**Standard Reports** icon), viewing and annotating downtime events (**Downtime** icon), and graphically displaying the data (**Plotting** icon). This screen also allows the user to access and start the DSS (**DSS** icon), and to exit the program and return to the main Unix window (**Exit** icon).

The main menu screen also provides access to the **Setup** function (icon not shown in Figure 9 above). This function allows the user to input into the system database information related to a dredging project and dredge. The user cannot access or modify in any way the data maintained within the database which originated in the DSS, or was computed by the SHIP component from the DSS measured data.

To use any of these modules, click on the appropriate icon in the main screen and the selected module will start running. Use of the screens within each module is discussed in the following sections.

## Setup

The **Setup** module allows the user to edit or enter information regarding dredging projects, dredges and crew, dredging areas, disposal areas, and local marine landmarks. The types of information which may be entered have been defined and the SHIP database constructed to permit this information to be loaded into the database. The final user screens to permit entry and editing of

this information have not yet been developed for the SHIP system. Examples of the probable screens have been developed, and are displayed within this section.

The SHIP system automatically links the information entered within **Setup** to the appropriate dredging projects by three primary pieces of information: project name, contract ID number, and dredge name. The project name and contract ID, taken together, form the unique identifier for labeling information contained within **Setup**, and data sets contained in the SHIP or SHORE databases. The project name and contract ID attached to data within the SHIP/ SHORE databases are attached by the DSS. Correlation of information within the **Setup** files and data within the databases is performed by matching identical project name/contract ID pairs, and then dredge names.

To access the **Setup** screens:

- Turn on the inspector's interface computer containing the Windows Operating System.
- Start Windows by typing **WIN**.
- Click on the **DOSIS** icon to display the first **Setup** screen.

The first **Setup** screen contains a primary menu (across the top of the screen) and pull-down submenus (located below the primary headings). This menu works similar to all Windows menus. The menu contains the following items:

Project	District	Dredge	Crew member	Station	Disposal area	Landmark	Help	Exit
Add	Add	Add	Add	Add	Add	Add		
View/edit	View/edit	View/edit	View/edit	View/edit	View/edit	View/edit		
Delete	Delete	Delete	Delete	Delete	Delete	Delete		

The **Setup** menu shown above provides the user access to the screens on which information entry, viewing, editing, and deleting occur. To access the desired menu item:

- Click on the primary menu heading for the information to be entered, and the submenu under that heading will appear.
- Click on the submenu item of interest.

The following sections describe how to enter, view, edit, and delete information under each of the primary headings. After entry of this information, the information must also be assigned to specific projects for it to be placed in all the proper **Setup** database files.

## Project information

To input or access project information within **Setup**:

- Click on the **Project** heading in the **Setup** menu.
- Click on the submenu item of interest.

**Add a new project.** To add a new project:

- Click on **Add** under the **Project** menu, and the **New Project Panel** screen will appear (Figure 10).

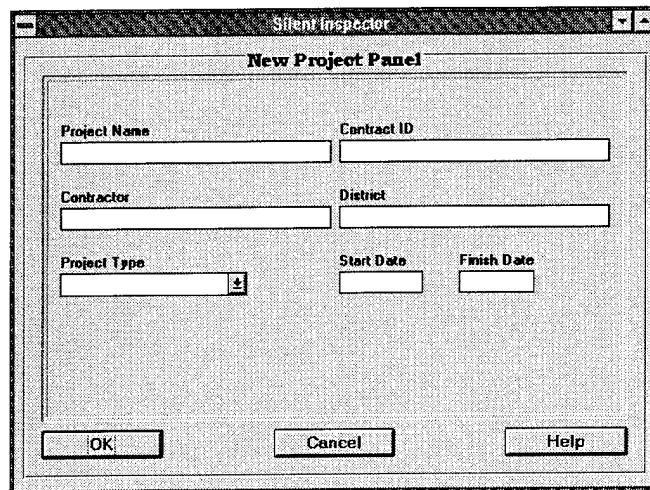


Figure 10. **New Project Panel** screen

To enter information on a new project, begin by entering the project name. After entering any information, click on another data entry box or press **ENTER**. Pressing the **ENTER** key will both enter the data and move the cursor to the next box. The information that can be entered, its definition, and the maximum number of characters allowed for each entry are shown below.

Project information	Definition	Characters
Project name	Name of the project	32
Contract ID	Corps of Engineers contract number	32
Contractor	Name of contractor	32
District	Corps of Engineers District name	32
Project type	New work, or maintenance	list selection
Start date	Project starting date	mm/dd/yy
Finish date	Expected finish date	mm/dd/yy

For selecting the **Project Type**, a pull-down arrow is provided that displays the two options available: new work, or maintenance work. To make this selection:

- Click on the pull-down arrow to view the options.
- Click on the proper option.

After completing this screen:

- Click on **OK** to enter the information into the SHIP database, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel input of the information into the SHIP database, and to return to the **Setup** menu screen.

**View or edit existing project information.** To view or edit project information already entered into the SHIP **Setup** files:

- Click on **View/Edit** under the **Project** menu, and the **Edit Project Panel** screen (Figure 11) will appear.

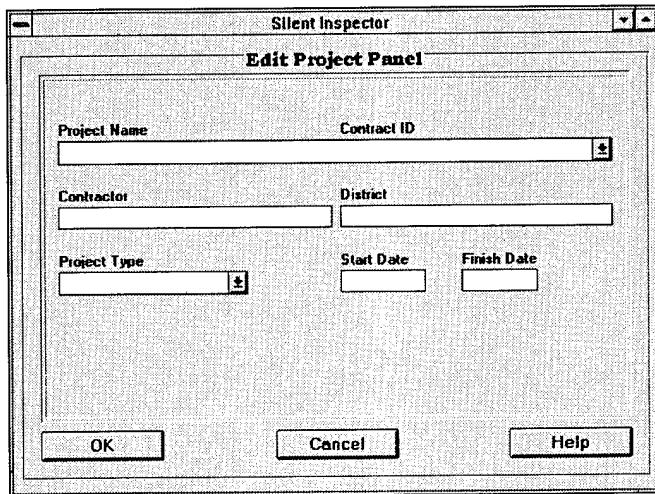


Figure 11. **Edit Project Panel** screen

- Click on the **pull-down** button to the right of the **Project Name/ Contract ID** box to access a list of projects already entered.
- Use the **scroll** button if needed, and click on the **Project Name/ Contract ID** of interest.

The project information entered for this **Project Name/Contract ID** pairing will now appear on the **Edit Project Panel** screen. This information can be simply viewed, or changed. To edit the information shown on this screen:

- Click on the information box containing the data to be changed, or press the **ENTER** key to move between boxes.
- Press the **BACKSPACE** key to delete information within the box, and then enter the new information, or place the cursor at any location in the information displayed, and insert desired changes.
- Click on another information box, or press the **ENTER** key to move to another box.
- When all entries are completed, click on **OK** to enter these changes into the SHIP database.

Or:

- Click on **Cancel** to prevent the changes from being entered into the database.

Note that the Project Type can be changed using a pull-down menu.

**Delete a project.** To delete a project and its information:

- Click on **Delete** under the **Project** menu, and the **Delete Project Panel** screen (Figure 12) will appear.

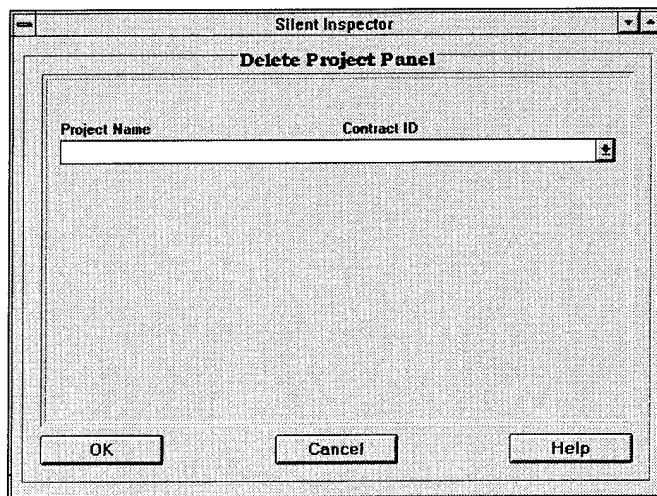


Figure 12. **Delete Project Panel** screen

- Click on the **pull-down** button to the right of the **Project Name/ Contract ID** box to access a list of projects already entered.
- Use the **scroll** button if needed, and click on the **Project Name/ Contract ID** to be deleted.

- Click on the **OK** button.

A confirmation screen will appear to confirm that the selected project information is to be deleted from the database.

- Click on **Yes** to delete the project.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the project and its information from the SHIP **Setup** database files.

### **Corps of Engineers Districts**

One item of information contained on the **Project Panel** screens is the Corps of Engineers District for which the work is being performed. To allow the user to select the appropriate District from a list of District names using the pull-down button to the right of this box (not shown on Figures 10 and 11, but will be added in near future), **Setup** provides for entry of all desired District names into a file which interacts with the **Project Panel** screens.

**Add a District.** Entry of District names is performed on the **New District Panel** screen (Figure 13) as follows:

- Click on **Add** under the **District** menu, and the **New District Panel** screen will appear.
- Enter a District name, and click on the **Abbreviation** box, or press **ENTER**.
- Enter the two- or three-letter abbreviation for the District, and press **ENTER**.

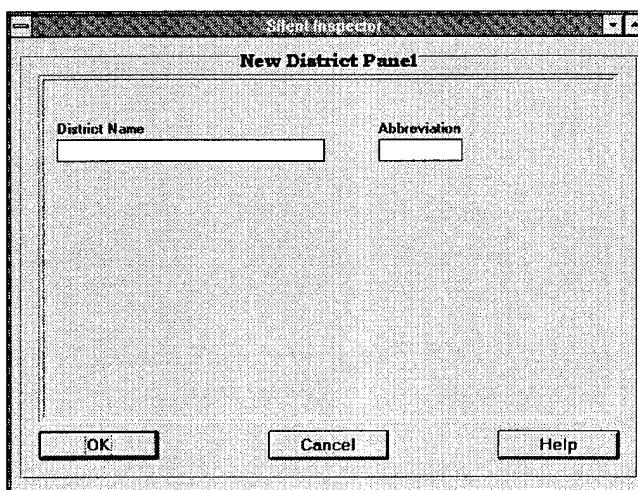


Figure 13. **New District Panel** screen

- Click on **OK** to enter the information into the **Setup** files, or click on **Cancel** to void the information entry and return to the **Setup** menu screen.

**Edit a District name or abbreviation.** To edit a previously entered District name or abbreviation:

- Click on **Edit** under the **District** menu, and the **Edit District Panel** screen (Figure 14) will appear.

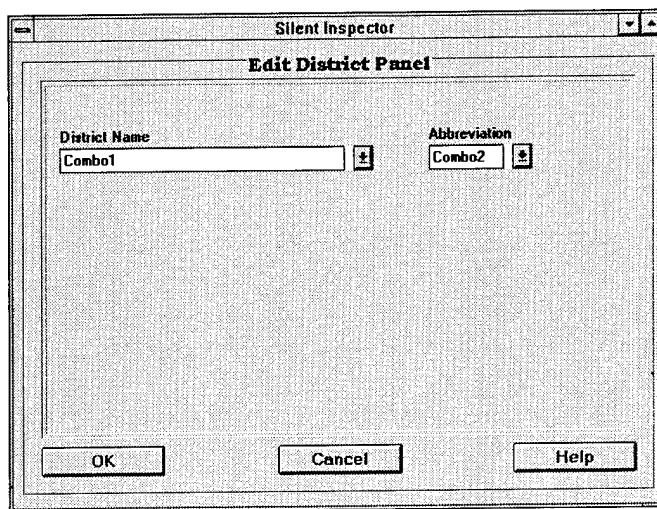


Figure 14. **Edit District Panel** screen

- Click on the **pull-down** button to the right of the **District Name** or **Abbreviation** boxes, and a list of previously entered names or abbreviations will appear.
- Use the **scroll** buttons to find the District of interest, and click on the District name or abbreviation to select it.
- Press the **BACKSPACE** key to eliminate the selected name or abbreviation, or enter edits as needed, and press **ENTER**.
- Click on **OK** to enter the revised information into the **Setup** files, or click on **Cancel** to void the information editing and return to the **Setup** menu screen.

**Delete a District.** To delete a District:

- Click on **Delete** under the **District** menu, and the **Delete District Panel** screen (Figure 15) will appear.

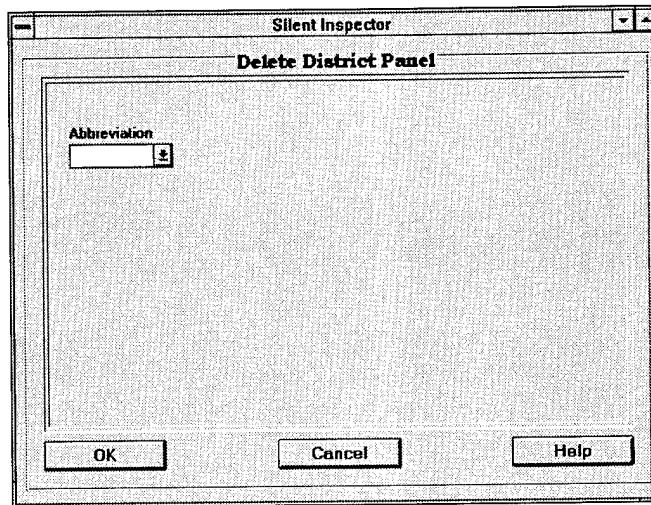


Figure 15. **Delete District Panel** screen

- Click on the **pull-down** button to the right of the District name **Abbreviation** box to access a list of Districts already entered.
- Use the **scroll** button if needed, and click on the District to be deleted.
- Click on **OK**.

A confirmation screen will appear to confirm that the selected District information is to be deleted from the database.

- Click on **Yes** to delete the District.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the District from the **SHIP Setup** database files.

### **Dredge information**

The dredge information module within **Setup** allows entering of data about dredge ships. To input or access dredge information within **Setup**:

- Click on **Dredge** in the **Setup** menu.
- Click on the submenu item of interest.

**Add a dredge.** To add a dredge, click on **Add** under the **Dredge** menu. This will bring up the **New Dredge Panel** screen (Figure 16).

To enter information, begin by entering the dredge name. After entering information, press **ENTER** or click on another data entry box. The information

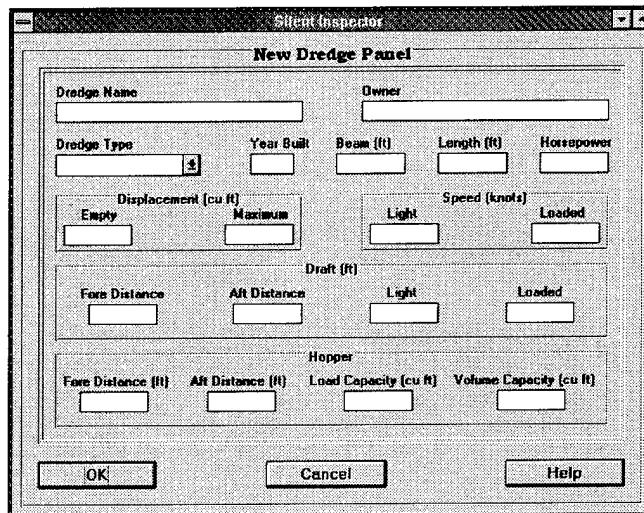


Figure 16. **New Dredge Panel** screen

that can be entered, its definition, and the maximum number of characters allowed for each entry are shown below.

Dredge Information	Definition	Characters
Dredge name	Name of dredge	32
Owner	Name of owner	32
Dredge type	Type of hopper dredge	Preset
Year built	Year of vessel	4
Beam	Maximum beam	4
Length	Maximum length	4
Horsepower	Dredging pumps horsepower	6
Displacement empty	Vessel displacement with hopper empty	6
Displacement full	Vessel displacement with hopper full	6
Speed light	Maximum speed hopper empty	2
Speed loaded	Maximum speed hopper full	2
Draft fore distance	Longitudinal distance from the vessel's forward perpendicular to the forward draft sensor	4
Draft aft distance	Longitudinal distance from the vessel's forward perpendicular to the aft draft sensor	4
Draft light	Average draft with hopper empty	2
Draft loaded	Average draft with hopper full	2
Hopper fore distance	Longitudinal distance from the vessel's forward perpendicular to the forward hopper ullage sensor	4
Hopper aft distance	Longitudinal distance from the vessel's forward perpendicular to the aft hopper ullage sensor	4
Hopper load capacity	Capacity of hopper fully loaded	6
Hopper volume capacity	Volume of hopper at max load	6

After completing this screen:

- Click on **OK** to enter the information into the **SHIP Setup** files, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel input of the information into the SHIP database, and return to the **Setup** menu screen.

**View or edit existing dredge information.** To view or edit dredge information already entered into the SHIP **Setup** files:

- Click on **View/Edit** under the **Dredge** menu, and the **Edit Dredge Panel** screen (Figure 17) will appear.

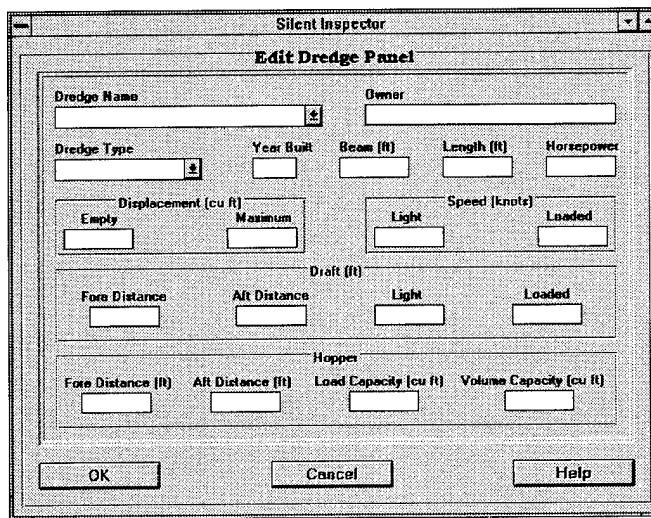


Figure 17. **Edit Dredge Panel** screen

- Click on the **pull-down** button to the right of the **Dredge Name** box to access a list of dredges already entered.
- Use the **scroll** button if needed, and click on the **Dredge Name** of interest.

The dredge information entered for the selected dredge will now appear on the **Edit Dredge Panel** screen. This information can be simply viewed, or changed. To edit the information shown on this screen:

- Click on the information box containing the data to be changed, or press the **ENTER** key to move between boxes.
- Press the **BACKSPACE** key to delete information within the box, and then enter the new information, or place the cursor at any location in the information displayed, and insert desired changes.
- Click on another information box, or press the **ENTER** key to move to another box.

- When all entries are completed, click on **OK** to enter these changes into the SHIP database.

Or:

- Click on **Cancel** to prevent the changes from being entered into the database.

**Delete a dredge.** To delete a dredge and its information:

- Click on **Delete** under the **Dredge** menu, and the **Delete Dredge Panel** screen (Figure 18) will appear.

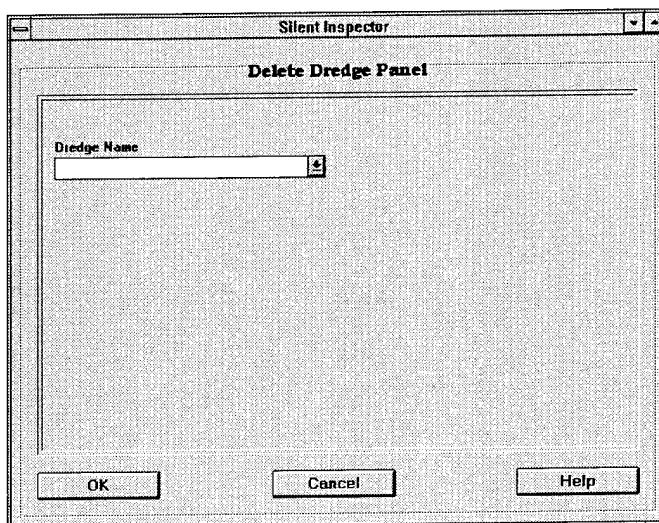


Figure 18. **Delete Dredge Panel** screen

- Click on the **pull-down** button to the right of the **Dredge Name** box to access a list of dredges already entered.
- Use the **scroll** button if needed, and click on the **Dredge Name** to be deleted.
- Click on the **OK** button.

A confirmation screen will appear to confirm that the selected dredge is to be deleted from the database.

- Click on **Yes** to delete the dredge.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the dredge and its information from the SHIP **Setup** database files.

**Assign a dredge to a project.** Information on multiple dredges can be entered into the **Setup** files; however, this information will not be correlated to project information unless the user assigns the dredges to particular projects. A dredge can be assigned to multiple projects, and multiple dredges can be assigned to a single project. The **Dredge Assignment Panel** screen (Figure 19) is used to assign a dredge to a project.

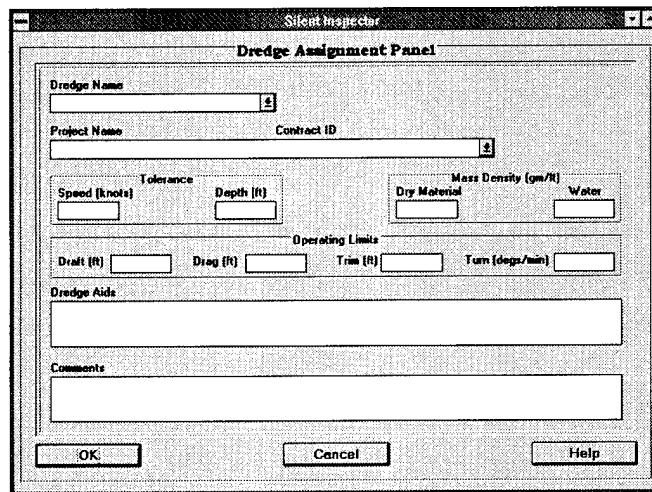


Figure 19. **Dredge Assignment Panel** screen

To assign a dredge to a project:

- Click on **Assign** under the **Dredge** menu.
- Click on the **pull-down** button to the right of the **Dredge Name** box, and a list of dredge names previously entered will appear.
- Use the **scroll** button to find the dredge of interest, and click on the **Dredge Name** to select it.
- Click on the **pull-down** button to the right of the **Project Name** box, and a list of projects previously entered will appear.
- Use the **scroll** button to find the project of interest, and click on the **Project Name** to select it.
- Click on the remaining data entry boxes, and enter the required information.

The remaining information to be entered on this screen helps define the operating limits of the dredge, and the anticipated density of the material to be dredged. After entering information, press **ENTER** or click on another data entry box. The information that can be entered, its definition, and the maximum number of characters allowed for each entry are shown below.

Dredge Information	Definition	Characters
Tolerance: speed	Maximum vessel speed	2
Tolerance: depth	Maximum dredging depth below water surface	3
Mass density: dry material	Mass density of dry material sediment grains	6
Mass density: water	Estimated mass density of material in water	6
Operating limits: draft	Maximum vessel draft	2
Operating limits: drag	Maximum drag arm depth	2
Operating limits: trim	Maximum trim	2
Operating limits: turn	Maximum rate of turn possible with vessel	4
Dredge aids	Any comments on dredged material/location	240
Comments	Any comments desired by user about the vessel	240

After completing this screen:

- Click on **OK** to complete assigning the dredge to a project, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel assigning a dredge to a project, and to return to the **Setup** menu screen.

### Crew member information

Names and positions (rank) of the captain and crew of the dredges can be entered via **Setup**. Entering new names will not overwrite names already in the database. The **Setup** files have no means of tracking the time period each crew member was aboard the dredge.

**Add crew members.** To add a crew member, click on **Add** under the **Crew Member** menu. This will bring up the **New Crew Member Panel** screen (Figure 20).

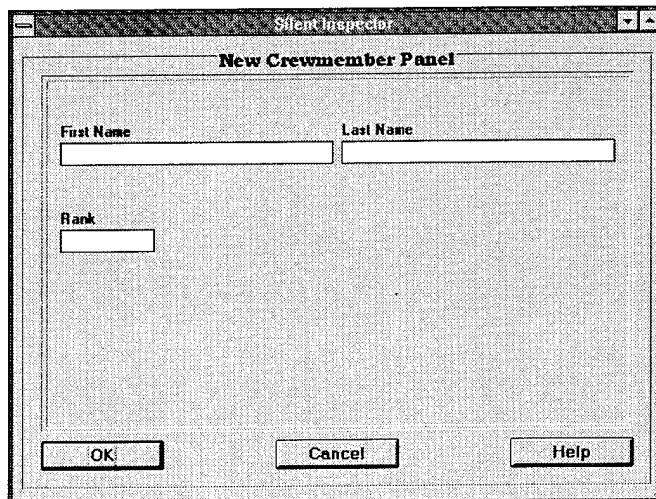


Figure 20. **New Crew Member Panel** screen

The crew information that can be entered, its definition, and the maximum number of characters allowed for each entry are shown below.

Crew Member Information	Definition	Characters
First name	Person's first name	32
Last name	Person's last name	32
Rank	Position aboard dredge (Captain, 1st mate, etc.)	32
Crew ID*	Person's initials	3

\* This information box is currently missing from the New Crew Member Panel screen.

To enter crew information:

- Click on each information entry box, or use the **ENTER** key to move between the boxes.
- After selecting a box, enter the appropriate information, and press the **ENTER** key.
- Click on **OK** to enter the information, or **Cancel** to cancel the entry.

**View or edit crew member information.** To view or edit crew member information already entered into the SHIP Setup files:

- Click on **View/Edit** under the **Crew Member** menu, and the **Edit Crew Member Panel** screen (Figure 21) will appear.

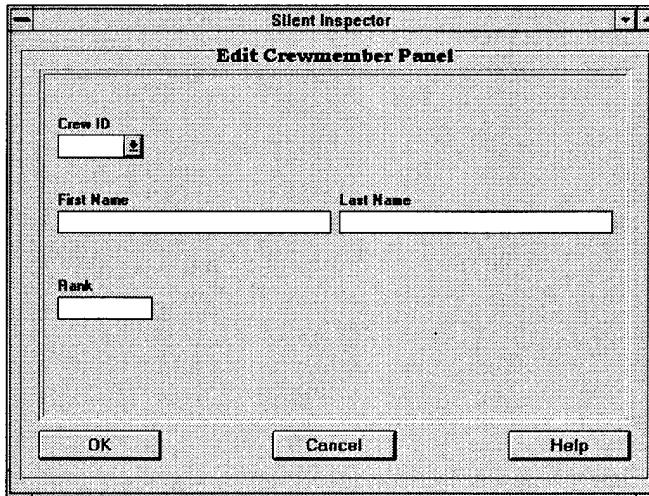


Figure 21. **Edit Crew Member Panel** screen

- Click on the **pull-down** button to the right of the **Crew ID** box to access a list of crew members already entered.
- Use the **scroll** button if needed, and click on the **Crew ID** of interest.

Crew member information will now appear. This information can be simply viewed, or changed. To edit the information shown on this screen:

- Click on the information box containing the data you wish to change, or press the **ENTER** key to move between boxes.
- Press the **BACKSPACE** key to delete information within the box, and then enter the new information, or place the cursor at any location in the information displayed, and insert desired changes.
- Click on another information box, or press the **ENTER** key to move to another box.
- When all entries are completed, click on **OK** to enter these changes into the SHIP database.

Or:

- Click on **Cancel** to prevent the changes from being entered into the database.

**Delete crew member information.** To delete a crew member:

- Click on **Delete** under the **Crew Member** menu, and the **Delete Crew Member Panel** screen (Figure 22) will appear.

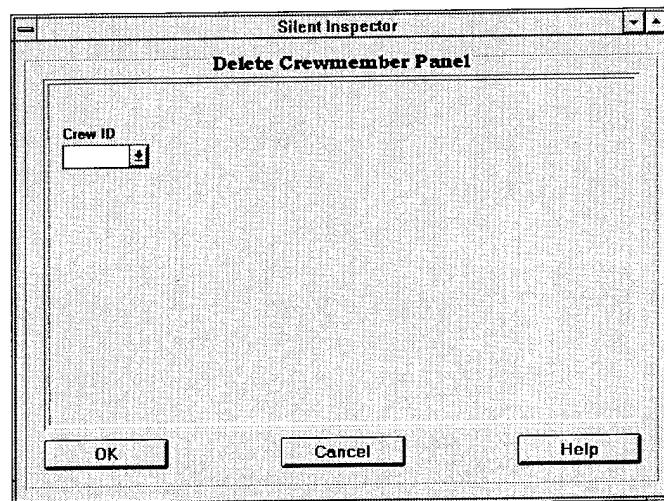


Figure 22. **Delete Crew Member Panel** screen

- Click on the **pull-down** button to the right of the **Crew ID** box to access a list of crew members already entered.
- Use the **scroll** button if needed, and click on the crew member to be deleted.

- Click on **OK**.

A confirmation screen will appear to confirm that the selected crew member is to be deleted from the database.

- Click on **Yes** to delete the crew member.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the crew member from the SHIP Setup files.

**Assign a crew member to a dredge.** Crew members must be assigned to dredges and particular projects. Assigning a crew member to a dredge and project is performed using the **Crew Member Assignment Panel** screen (Figure 23).

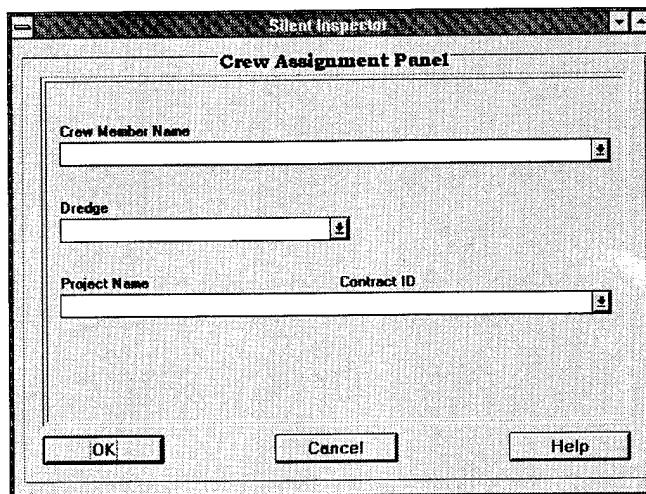


Figure 23. **Crew Member Assignment Panel** screen

To assign a crew member to a dredge:

- Click on **Assign** under the **Crew Member** menu.
- Click on the **pull-down** button to the right of the **Crew Member Name** box, and a list of crew member names previously entered will appear.
- Use the **scroll** button to find the crew member of interest, and click on it.
- Click on the **pull-down** button to the right of the **Dredge** box, and a list of dredges previously entered will appear.
- Use the **scroll** button to find the dredge of interest, and click on it.

- Click on the **pull-down** button to the right of the **Project Name/ Contract ID** box, and a list of project name/contract ID pairs will appear.
- Use the **scroll** button to find the project of interest, and click on it.

After completing this screen:

- Click on **OK** to complete assigning the crew member to a dredge and project, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel the assignment, and return to the **Setup** menu screen.

## **Dredging Areas**

Within the SI, dredging areas are called “stations.”

Information on an unlimited number of dredging areas can be entered into SHIP. Each dredging area must be named and delineated as a rectangle. Two opposite corner x,y coordinates must be entered to define the rectangle. The x,y coordinates must be in the same coordinate system as provided by the navigation data input into SHIP from the DSS.

Each dredging area must be assigned to one or more dredging projects. SHIP can then automatically compare each navigation coordinate received from the DSS to the rectangular dredging area boundaries to determine when the dredge is inside or outside the designated dredging areas during its operations.

The SI handles only rectangular dredging areas. However, nonrectangular dredging areas can be accommodated by defining several rectangular areas that cover the nonrectangular dredging area and then assigning all of the rectangular areas to the project. In some cases, this may provide more flexibility than defining the dredging area as a single area since the SI maintains information about dredging activities in each of the dredging areas assigned to a project. Under certain circumstances, it may be useful to track which part of a dredging area was being worked at a given time.

**Add a dredging area (station).** To add a dredging area, click on the **Add** item under the **Station** menu. This will bring up the **New Station Panel** screen (Figure 24).

To enter dredging area information:

- Click on the **Station** (dredging area) **Name** box, enter a name, and press the **ENTER** key.

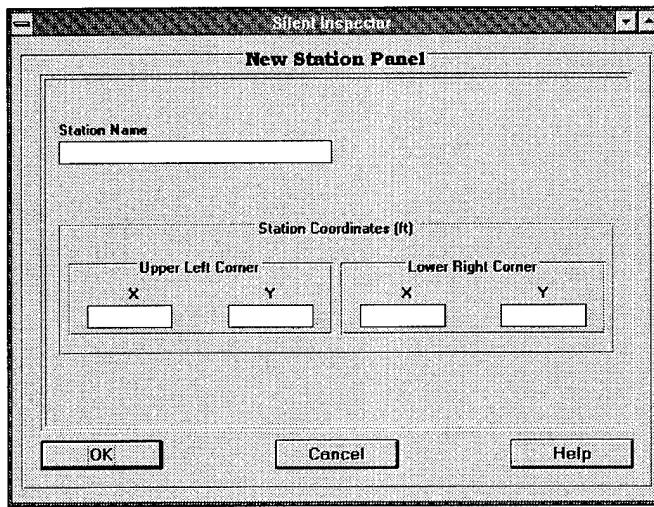


Figure 24. **New Station Panel** screen

- Click on the **Station Coordinates** boxes, and enter the x and y coordinates for the upper left and lower right corners of the rectangle which will represent the dredging area (or a portion of the dredging area).
- Press **ENTER** after entering each coordinate.
- Click on **OK** to enter the information, or **Cancel** to cancel the entry.

**View or edit dredging area (station) information.** To view or edit dredging area information already entered into the SHIP Setup files:

- Click on **View/Edit** under the **Station** menu, and the **Edit Station Panel** screen (Figure 25) will appear.

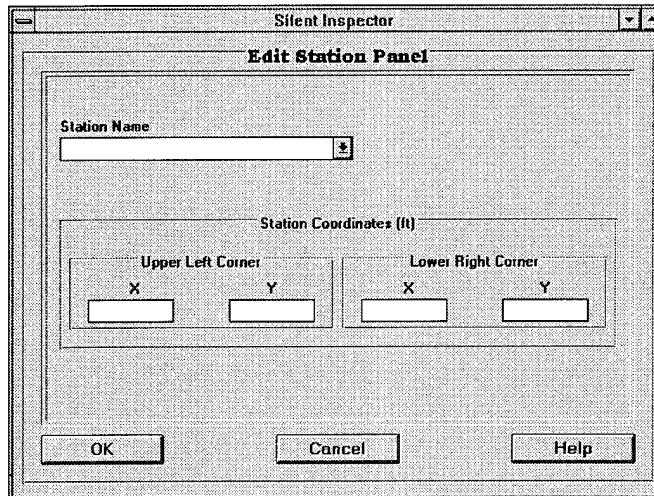


Figure 25. **Edit Station Panel** screen

- Click on the **pull-down** button to the right of the **Station Name** box to access a list of dredging areas already entered.
- Use the **scroll** button if needed, and click on the dredging area of interest.

The dredging area information will now appear. This information can be simply viewed, or changed. To edit the information shown on this screen:

- Click on the information box containing the data to be changed, or press the **ENTER** key to move between boxes.
- Press the **BACKSPACE** key to delete information within the box, and then enter the new information, or place the cursor at any location in the information displayed, and insert desired changes.
- Click on another information box, or press the **ENTER** key to move to another box.
- When all entries are completed, click on **OK** to enter these changes into the SHIP database.

Or:

- Click on **Cancel** to prevent the changes from being entered into the database.

**Delete a dredging area (station).** To delete a dredging area:

- Click on **Delete** under the **Station** menu, and the **Delete Station Panel** screen (Figure 26) will appear.

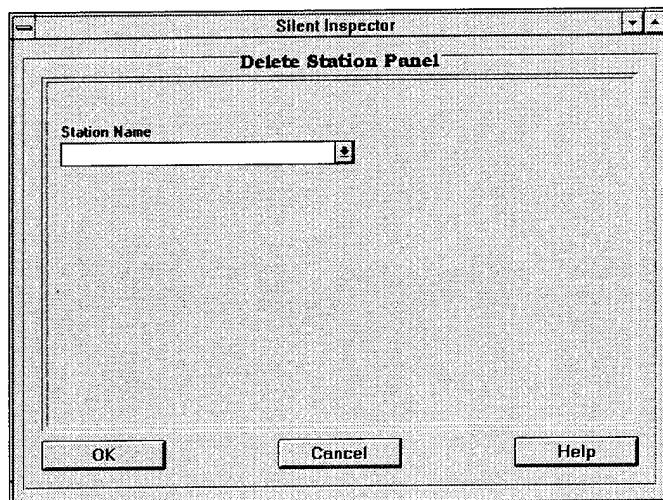


Figure 26. **Delete Station Panel** screen

- Click on the **pull-down** button to the right of the **Station Name** box to access a list of dredging areas already entered.
- Use the **scroll** button if needed, and click on the dredging area to be deleted.
- Click on the **OK** button.

A confirmation screen will appear to confirm that the selected dredging area is to be deleted from the database.

- Click on **Yes** to delete the dredging area.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the dredging area from the **SHIP Setup** files.

**Assign a dredging area (station) to a project.** Dredging areas must be assigned to particular projects. Assigning a dredging area to a project is performed using the **Station Assignment Panel** screen (Figure 27). Note that any number of rectangular dredging areas may be assigned to a project.

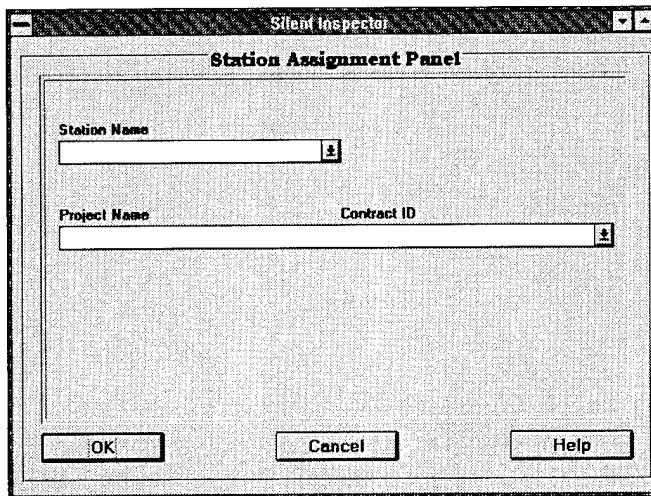


Figure 27. **Station Assignment Panel** screen

To assign a dredging area to a project:

- Click on **Assign** under the **Station** menu.
- Click on the **pull-down** button to the right of the **Station Name** box, and a list of dredging area names previously entered will appear.
- Use the **scroll** button to find the dredging area of interest, and click on it.

- Click on the **pull-down** button to the right of the **Project Name/ Contract ID** box, and a list of project name/contract ID pairs will appear.
- Use the **scroll** button to find the project of interest, and click on it.

After completing this screen:

- Click on **OK** to complete assigning the dredging area to a project, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel the assignment, and return to the **Setup** menu screen.

### **Disposal areas**

Information on an unlimited number of disposal areas can be entered into SHIP. Each disposal area must be named and delineated by a rectangle. Two opposite corner x,y coordinates must be entered to define the rectangle. The x,y coordinates must be in the same coordinate system as provided by the navigation data input into SHIP from the DSS.

Each disposal area must be assigned to one or more dredging projects. SHIP can then automatically compare each navigation coordinate received from the DSS to the rectangular disposal area boundaries to determine when the dredge is inside or outside the designated disposal areas during its operations.

Similar to dredging areas, the SI can only define disposal areas as rectangles. Non-rectangular areas can be defined using several rectangles covering the total area of interest. See “Adding a Dredging Area (Station)” for more details.

**Add a disposal area.** To add a disposal area, click on **Add** under the **Disposal Area** menu. This will bring up the **New Disposal Area Panel** screen (Figure 28).

To enter disposal area information:

- Click on the **Disposal Area Name** box, enter the name, and press the **ENTER** key.
- Click on the **Disposal Area Coordinates** boxes, and enter the x and y coordinates for the upper left and lower right corners of the rectangles which will represent the disposal area.
- Press **ENTER** after entering each coordinate.

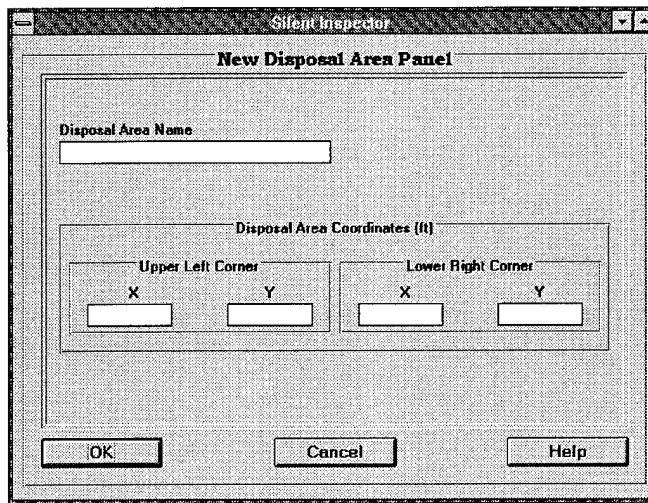


Figure 28. **New Disposal Area Panel** screen

- Click on **OK** to enter the information, or **Cancel** to cancel the entry.

**View or edit disposal area information.** To view or edit disposal area information already entered into the SHIP Setup files:

- Click on **View/Edit** under the **Disposal Area** menu, and the **Edit Disposal Area Panel** screen (Figure 29) will appear.

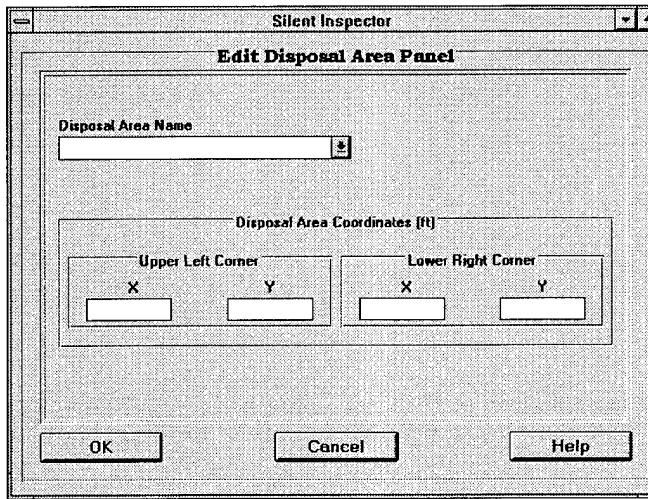


Figure 29. **Edit Disposal Area Panel** screen

- Click on the **pull-down** button to the right of the **Disposal Area Name** box to access a list of disposal areas already entered.
- Use the **scroll** button if needed, and click on the disposal area of interest.

Disposal area information will now appear. This information can be simply viewed, or changed. To edit the information shown on this screen:

- Click on the information box containing the data to be changed, or press the **ENTER** key to move between boxes.
- Press the **BACKSPACE** key to delete information within the box, and then enter the new information, or place the cursor at any location in the information displayed, and insert desired changes.
- Click on another information box, or press the **ENTER** key to move to another box.
- When all entries are completed, click on **OK** to enter these changes into the SHIP database.

Or:

- Click on **Cancel** to prevent the changes from being entered into the database.

**Delete a disposal area.** To delete a disposal area:

- Click on **Delete** under the **Disposal Area** menu, and the **Delete Disposal Area Panel** screen (Figure 30) will appear.

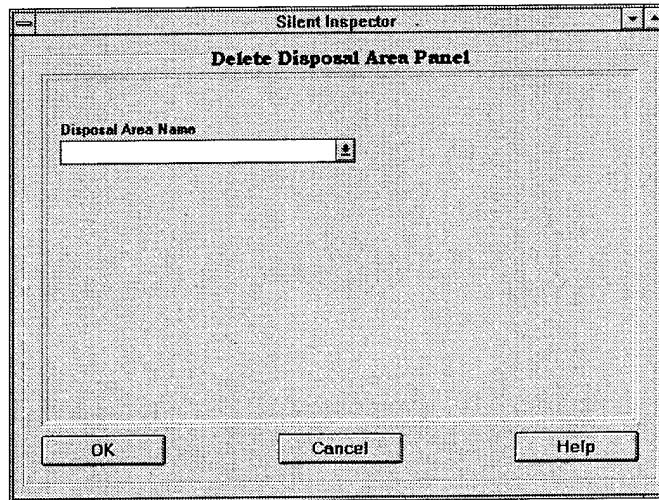


Figure 30. **Delete Disposal Area Panel** screen

- Click on the **pull-down** button to the right of the **Disposal Area Name** box to access a list of disposal areas already entered.

- Use the **scroll** button if needed, and click on the disposal area to be deleted.
- Click on the **OK** button.

A confirmation screen will appear to confirm that the selected disposal area is to be deleted from the database.

- Click on **Yes** to delete the disposal area.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the disposal area from the SHIP Setup files.

**Assign a disposal area to a project.** Disposal areas must be assigned to particular projects. Assigning a disposal area to a project is performed using the **Disposal Area Assignment Panel** screen (Figure 31). Note that any number of rectangular disposal areas can be assigned to a project.

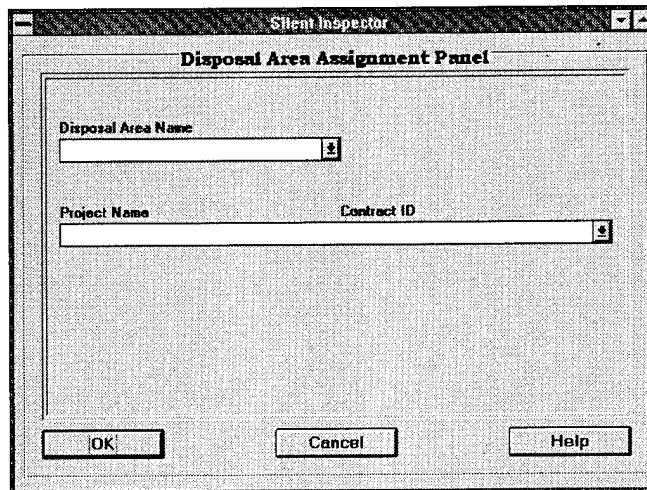


Figure 31. **Disposal Area Assignment Panel** screen

To assign a disposal area to a project:

- Click on **Assign** under the **Disposal Area** menu.
- Click on the **pull-down** button to the right of the **Disposal Area Name** box, and a list of disposal area names previously entered will appear.
- Use the **scroll** button to find the disposal area of interest, and click on it.
- Click on the **pull-down** button to the right of the **Project Name/ Contract ID** box, and a list of project name/contract ID pairs will appear.

- Use the **scroll** button to find the project of interest, and click on it.

After completing this screen:

- Click on **OK** to complete assigning the disposal area to a project, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel the assignment, and return to the **Setup** menu screen.

## Landmarks

Setup allows for the entry of marine landmarks that may aid in determining the position of dredging activity relative to dredging or disposal areas and to other locations. Landmarks are considered to be items that have one x,y coordinate position. Multiple landmarks may be entered into the system.

### Add a landmark

To add a landmark, click on **Add** under the **Landmarks** menu. This will bring up the **New Landmark Panel** screen (Figure 32).

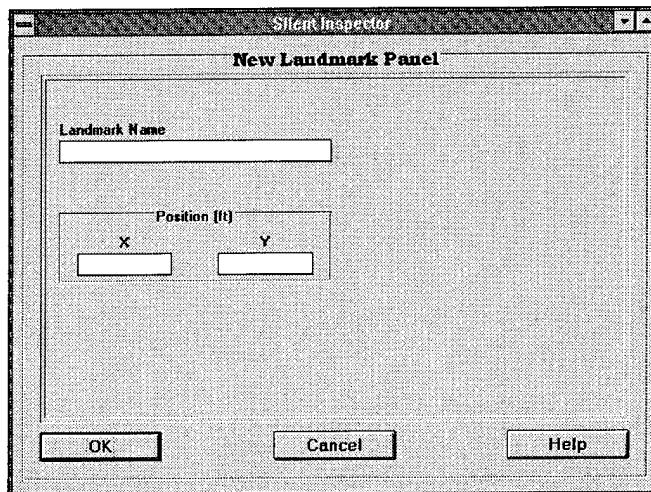


Figure 32. **New Landmark Panel** screen

To enter landmark information:

- Click on the **Landmark Name** box, enter the name, and press the **ENTER** key.

- Click on the **Position** boxes, and enter the x and y coordinates for the landmark.
- Press **ENTER** after entering each coordinate.
- Click on **OK** to enter the information, or **Cancel** to cancel the entry.

**View or edit landmark information.** To view or edit landmark information already entered into the SHIP Setup files:

- Click on **View/Edit** under the **Landmarks** menu, and the **Edit Landmark Panel** screen (Figure 33) will appear.

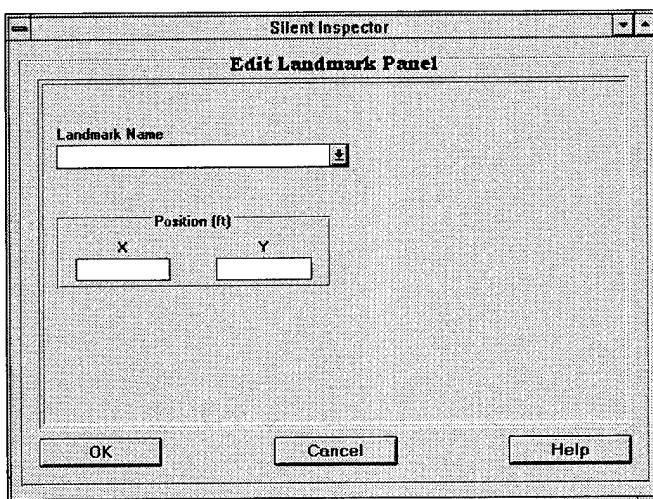


Figure 33. **Edit Landmark Panel** screen

- Click on the **pull-down** button to the right of the **Landmark Name** box to access a list of landmarks already entered.
- Use the **scroll** button if needed, and click on the landmark of interest.

Landmark information will now appear. This information can be simply viewed, or changed. To edit the information shown on this screen:

- Click on the information box containing the data to be changed, or press the **ENTER** key to move between boxes.
- Press the **BACKSPACE** key to delete information within the box, and then enter the new information, or place the cursor at any location in the information displayed, and insert desired changes.
- Click on another information box, or press the **ENTER** key to move to another box.

- When all entries are completed, click on **OK** to enter these changes into the SHIP database.

Or:

- Click on **Cancel** to prevent the changes from being entered into the database.

**Delete a landmark.** To delete a landmark:

- Click on **Delete** under the **Landmarks** menu, and the **Delete Landmark Panel** screen (Figure 34) will appear.

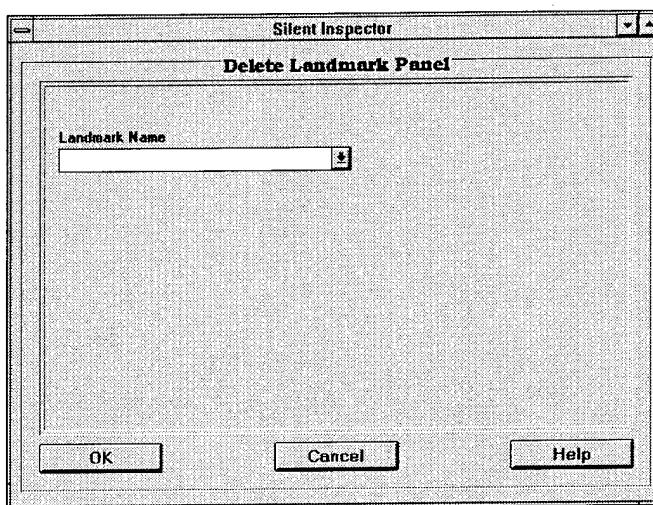


Figure 34. **Delete Landmark Panel** screen

- Click on the **pull-down** button to the right of the **Landmark Name** box to access a list of landmarks already entered.
- Use the **scroll** button if needed, and click on the landmark to be deleted.
- Click on the **OK** button.

A confirmation screen will appear to confirm that the selected landmark is to be deleted from the database.

- Click on **Yes** to delete the landmark.
- Click on **No** to cancel the delete command.

Clicking on **Yes** will delete the landmark from the SHIP Setup files.

**Assign a landmark to a project.** Landmarks must be assigned to particular projects. Assigning a landmark to a project is performed using the **Landmark Assignment Panel** screen (Figure 35).

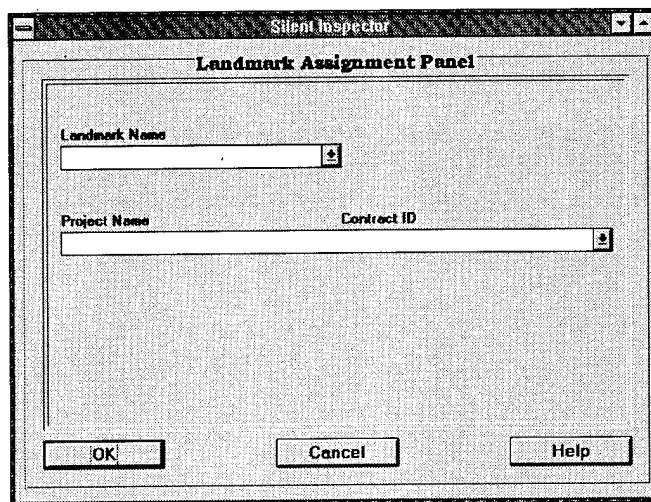


Figure 35. **Landmark Assignment Panel** screen

To assign a landmark to a project:

- Click on **Assign** under the **Landmarks** menu.
- Click on the **pull-down** button to the right of the **Landmark Name** box, and a list of landmark names previously entered will appear.
- Use the **scroll** button to find the landmark of interest, and click on it.
- Click on the **pull-down** button to the right of the **Project Name/ Contract ID** box, and a list of project name/contract ID pairs will appear.
- Use the **scroll** button to find the project of interest, and click on it.

After completing this screen:

- Click on **OK** to complete assigning the landmark to a project, and return to the **Setup** menu screen.

Or:

- Click on **Cancel** to cancel the assignment, and return to the **Setup** menu screen.

## Monitoring Incoming Data

When the SI software is first started by entering the user ID and password, the SHIP database becomes active and begins accepting data input from an active DSS. These incoming data can be viewed using the **Dredging Operations** screen (Figure 36). To access this screen:

- Click on the **Monitoring** icon located on the system main menu screen (Figure 9).

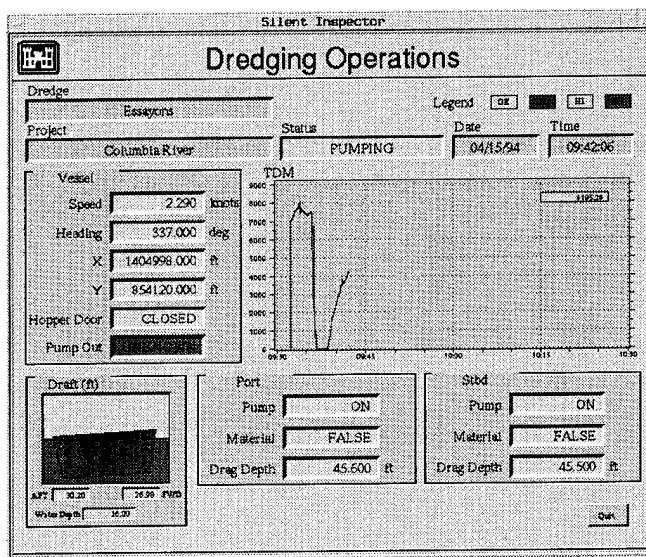


Figure 36. **Dredging Operations** screen

The **Dredging Operations** screen allows the user to monitor, in real time, the actual data being inserted into the SHIP database by the DSS. The data displayed are the most recent data inserted by the DSS into the SHIP database. For each piece of incoming data displayed as a numerical value, the background color indicates whether the data shown are OK, out of range low, out of range high, or missing as compared to data range limits established by the system administrator (see Chapter 4). If no new data are being received from the DSS, the last values, along with their date and time, remain displayed on the screen.

This screen also displays two values computed by SHIP from the displayed incoming data: the TDM of material retained in the hopper (TDM), and the current dredging state (**Status**). A plot of TDM versus time from the end of the last dumping event is provided, with time along the x axis. This screen will scroll whenever the TDM plot reaches the right-hand side of the plot, so that the newly arriving information continues to be visible on the left-hand side of the plot.

The dredging state displayed in the **Status** box is calculated based on the displayed data. The seven dredge states the system identifies are as follows:

- a. Dredging.
- b. Turning.
- c. Sailing to dump (disposal) area.
- d. Dumping.
- e. Sailing to dredging area.
- f. Downtime.
- g. Pumping out material.

SHIP can accurately and consistently determine the dredging state most of the time. Two exceptions are **Turning** and **Downtime** states. **Turning** is difficult to distinguish from **Sailing To Dump**, **Sailing To Dredging Area**, and **Downtime** events. Downtime is difficult to determine unless the ship stops. Downtime will also be displayed whenever selected data are missing from the incoming data set inserted by DSS. For details concerning TDM and dredge state computations and limitations, see the system's technical reference manual.<sup>1</sup>

The **Dredging Operations** screen also provides a display representing the fore and aft draft of the ship to give the user a sense of the vessel loading. The angle of ship tilt and freeboard versus the waterline are exaggerated and not to any scale.

The user is able to view the incoming data, but not interact with the data in any way using the **Dredging Operations** screen. However, these data should be visually compared to the data displayed on the **DSS Control Panel** screen, and other sensor output displays on the dredge (such as the draft indicators), to ensure correct data are being inserted into the SHIP database.

To close the screen and return to the system's main menu screen:

- Click on the **Quit** button, or click on the minimize button in the upper right-hand corner of the screen.

## **Downtime Logging, Review, and Annotation**

Computation of downtime events within the SHIP system is intended to match the downtime definition currently used by the Corps of Engineers. It includes noneffective and lost time events. For details on how automated recognition of downtime events is performed, see the system's technical reference manual.<sup>1</sup>

Automated recognition of downtime events is still very difficult to perform. In addition, labeling of downtime events for their cause and providing comments or explanations cannot be performed automatically. The user must review all downtime events calculated by SHIP and assign a cause from a predefined list which matches those in use today. Comments concerning the downtime event can also be entered. The user cannot delete SHIP-computed downtime events,

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<sup>1</sup> *Ibid.*

only annotate them. The user is also not allowed to enter any additional downtime events not identified by SHIP.

Failure to assign a cause to a downtime event will result in incorrect time summaries for downtime within the daily and job reports. Should SHIP also incorrectly compute downtime event occurrences, the time summaries within the trip, daily, and job reports will be affected, and must be corrected by hand.

### Review of downtime events computed by SHIP

To review downtime events computed by SHIP, the user must know the project name/contract ID for which the downtime events occurred. To access listings of the downtime events:

- Click on the **Downtime** icon on the system main menu screen (Figure 9).

If there are data within the SHIP database for only one project name and contract ID pair, then these will appear in the appropriate boxes on the **Downtime Selection** screen (Figure 37).

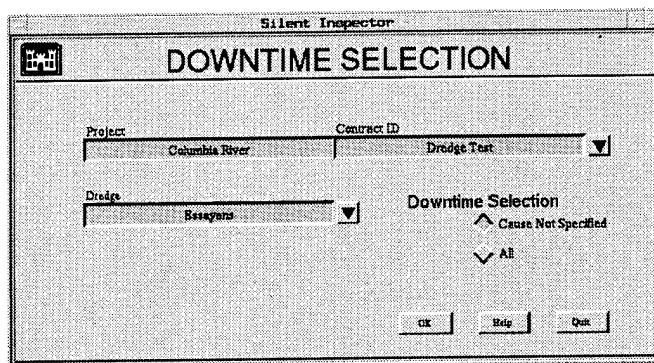


Figure 37. **Downtime Selection** screen

If multiple project name/contract ID pairs exist in the database, then a list of project name/contract ID pairs will appear. The user must select the desired project name/contract ID pair for which downtime events are to be reviewed. To select a pair:

- Click on a project name/contract ID pair to highlight it.
- Click on **OK**.

The selected project name/contract ID will be displayed in the appropriate fields. To select a different project name/contract ID pair:

- Click on the down arrow to the right of the contract ID box, and the selection list will again appear.

- Click on the project name/contract ID pair of interest.
- Click on **OK**.

If only one dredge name is contained within the SHIP database for the selected project name/contract ID pair, it will automatically be displayed in the **Dredge** box. If more than one exists, the user must select the dredge of interest for the downtime events. To select a dredge:

- Click on the down arrow to the right of the **Dredge** box, and a selection list of dredge names will appear.
- Click on the dredge of interest.
- Click on **OK**.

The user may select to view a list of all downtime events contained within the SHIP database for the project, contract id, and dredge selected, or only those which have not yet been assigned a cause. To do this:

- Click on the **Cause Not Specified** button to display all downtime events for which no cause has been attributed.

Or:

- Click on **All** to display all downtime events related to that project, contract ID, and dredge.
- Click on **OK** to display a list of the downtime events (Figure 38).

The downtime events **Selection List** screen lists the start date and time of each downtime event as well as the load number of the load in which the event occurred. Use the **scroll** button to find the downtime event of interest, and select the event by clicking on it. After selecting the appropriate downtime event:

- Click on **OK**, and information regarding the selected downtime event will be displayed on the **Downtime Input** screen (Figure 39).

Or:

- Click on **Cancel** to return to the **Downtime Selection** panel.

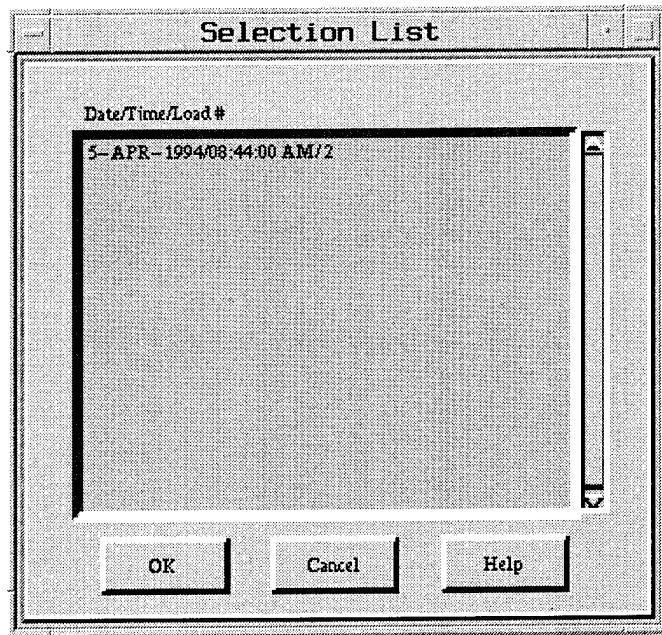


Figure 38. Individual downtime events **Selection List** screen

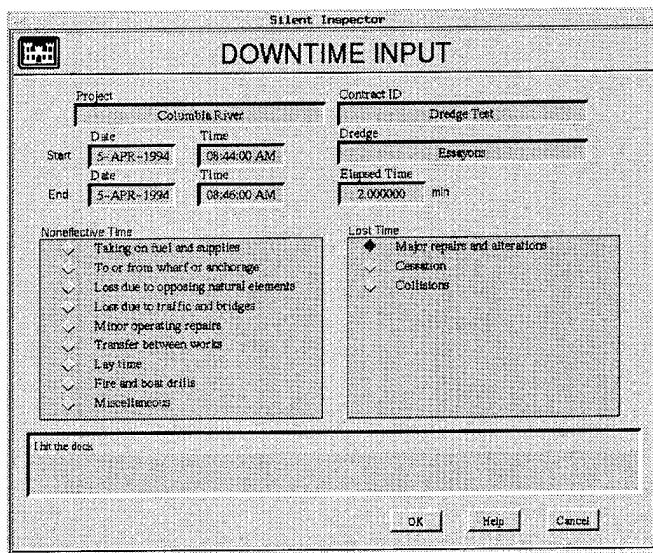


Figure 39. **Downtime Input** screen

The **Downtime Input** screen displays the start and end date and times, plus the elapsed time, of the selected downtime event. Buttons are provided to assign a cause to the downtime, and comments can be entered in the comment box to provide a better description.

To select a different downtime event to view:

- Click on **Cancel** to return to the **Downtime Selection** screen.

To assign a downtime cause, and enter comments, for the selected downtime event, follow the instructions in the next section.

### **Entry of downtime causes and comments**

On the **Downtime Input** screen, the user may attribute a downtime event to any of the noneffective time and lost time causes currently tracked manually for Corps of Engineers projects on Standard Forms 27 and 27A. To select a cause and enter comments regarding the event:

- Click on the button for the appropriate downtime event cause (only one cause may be selected per event).
- Click on the **Comments** box and enter comments up to 255 characters in length.
- Click on **OK** to enter the information into the database and return to the **Selection List** screen, or
- Click on **Cancel** to void the information entry and return to the **Selection List** screen.

The system does not allow entry of more than one cause using the predefined buttons; therefore, if a downtime event can be attributed to more than one cause, this should be noted under comments. Downtime events which are not attributed to a specified downtime cause will be listed as **To Be Defined** on the daily and job reports.

To change projects and continue:

- Return to the **Downtime Selection** screen by clicking on the **Cancel** button on the **Selection List** screen.
- Select a new **Project/Contract ID** or **Dredge** using the **scroll** buttons.
- Click on **Cause Not Specified** or **All**.
- Click on **OK**, and continue as before.

### **Editing of previously entered downtime causes and comments**

Editing of previously entered downtime causes and comments is permitted. To select the downtime event to edit:

- Select the **Project, Contract ID**, and **Dredge** on the **Downtime Selection** screen.

- Click on the **All** button.
- Click on **OK**, and the **Selection List** screen will appear.
- Select the downtime event of interest.
- Click on **OK**.

The downtime event, and previously entered cause and comments will appear. To edit the previously entered information:

- Click on the cause button for the particular cause you now wish to assign to the downtime event.
- Click on the **Comments** box and edit the comment, or enter a new comment.
- Click on **OK**.

The new cause and comments will now replace the previously entered cause and comments in the SHIP database.

## Standard Reports

SHIP prints summaries of dredging activities as trip, daily, and job reports. These reports are considered the system's standard reports. The trip, daily, and job reports are designed to be similar, but not exactly like, reports currently created by the Corps of Engineers. Examples of the system's three standard reports are contained in Appendix B.

The trip report lists sensor information and the dredge's position each time the system determines that the dredge enters a new dredging state. A dredge may make several turns between active dredging passes within a dredging area, so a trip report may show several changes in dredge state during a trip. The trip report also summarizes total trip elapsed time, and time spent performing each dredging state. The tons dry measure (TDM) of material retained, along with the tons of material retained per minute of the total trip time, are also displayed at the end of the report. The "dredge state accumulated time" and "tons retained information" at the end of the trip report are the basis for compiling the daily and job-to-date reports.

The daily report summarizes trip report information for all trips during the day. It lists the total trip elapsed time for each trip started during that day, time spent in each dredging state, total tons of material retained, and amount of material retained per pumping minute and per total trip minute. Time lost due to downtime is also listed and defined. Individual measured data items included on the trip report are not included in the daily report.

The job report summarizes the daily reports over the entire job to date. Presented are the total time spent working on the project, the time spent in each dredging state, total tons of material retained, and amount of material retained per minute based on the total elapsed working time. Time lost due to downtime is also defined.

The job report allows the user to show cost information for the project. This information is not measured or computed by the system, so it must be entered by the user. Inclusion of the cost information will allow the job report to more closely resemble job reports currently maintained by the Corps of Engineers.

SHIP automatically creates and prints the trip and daily standard reports for whichever project the SHIP database is actively receiving data. The user may also select, view, and print individual trip, daily, and job reports for any project contained in the SHIP database. Automatic and user-prompted standard reports are described in the next sections.

### **Automatic creation of standard reports**

During each project, trip and daily standard reports are generated automatically by SHIP at the end of each dredge trip (load), and at the end of each day, respectively. The start/end point of each report is as follows:

<b>Report</b>	<b>Start/End Point</b>
Trip report	From beginning of the "Sailing to Dredging Area" state to the end of each "Dumping" state. The point between the two is defined as when the hopper doors have closed. If a trip crosses over midnight, it is assigned to the day in which the trip begins, regardless of when it ends.
Daily report	The daily report begins with the first trip started during that day and ends with the last trip started during that day. The daily report includes any portion of the last trip of the day which may be completed during the following day. The report will not include any portion of a trip completed during that day which began the previous day.

Each standard report will be automatically printed within a few minutes of the end of each trip or the completion of the last trip of the day. No user actions are necessary for the automatic reports to print assuming the system's printer is attached and on-line. If a printer malfunction occurs, the reports will be printed automatically when the problem is fixed, provided the printer queue has not filled. Should this occur, some reports may need to be user-prompted.

The job report is not generated automatically because the SHIP unit cannot determine when a project has been completed during a year.

### **User-prompted standard reports**

The user may, at any time, select, view, and print any trip, daily, or job report for any project containing data within the SHIP database. Normally the SHIP database will contain only data from an active project; however, the system's

reporting capability is not limited to that project alone if data from other projects are in the database.

**Select and print a trip report.** To select, view, and print a trip report:

- Click on the **Standard Reports** icon on the system's main menu screen (see Figure 9).
- Click on the **Trip Report** icon on the **Standard Reports** main menu screen (Figure 40).

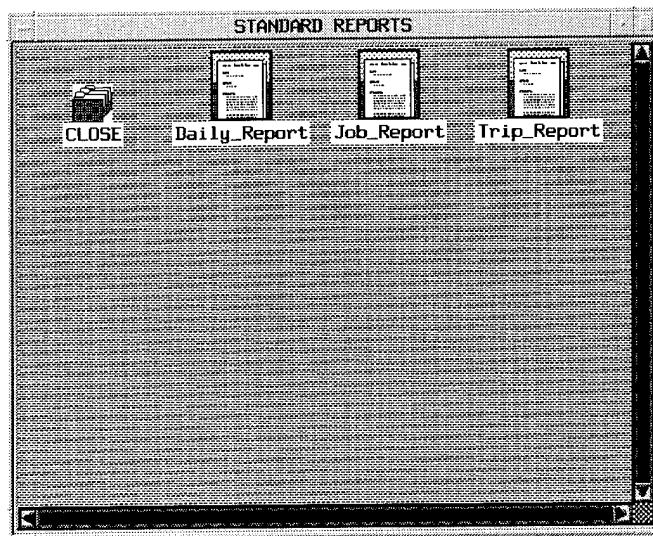


Figure 40. **Standard Reports** main menu screen

If only one project name/contract ID pair is present in the database, this information will appear within the appropriate boxes when the screen first appears (Figure 41). If more than one pair exists, a list of project name/ contract ID pairs will appear. To select a project name/contract ID pair:

- Click on the **Project Name/Contract ID** of interest.
- Click on **OK**.

The selected project name/contract ID will be displayed in the appropriate fields in the **Trip Report Panel**.

If only one dredge is assigned to the project name/contract ID shown on the **Trip Report Panel** screen, its dredge name will automatically appear in its appropriate field. If multiple dredges are assigned to the selected project name/contract ID, the user must select the dredge for which a trip report is to be displayed. To select a dredge name:

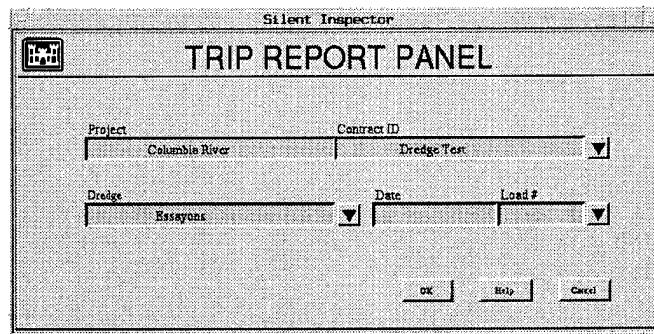


Figure 41. **Trip Report Panel** screen

- Click on the **pull-down** button to the right of the **Dredge** field, and a list of dredges will appear.
- Click on the dredge name of interest.
- Click on **OK**. This returns the user to the **Trip Report Panel** screen and places the selected dredge name in its field.

To select a particular trip for which to generate a report:

- Click on the **pull-down** button to the right of the **Load Number** field to display a list (Figure 42) of the dates and load (trip) numbers available in the database for the project, contract ID, and dredge selected.

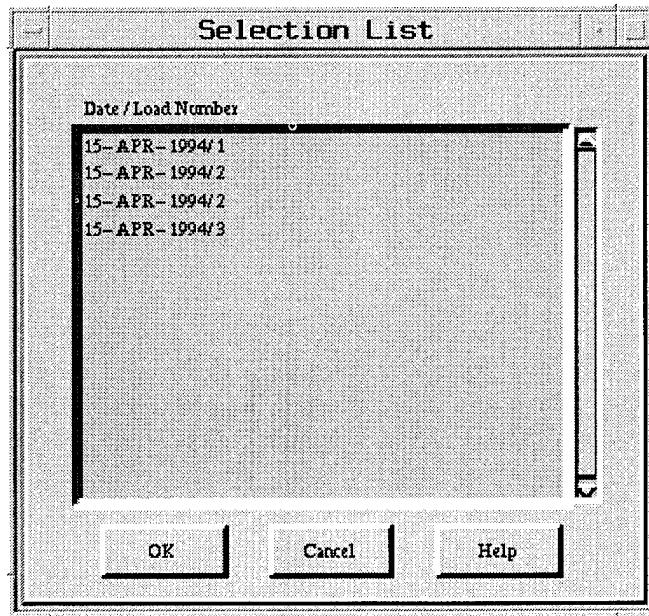


Figure 42. **Date and Load Number Selection List** screen

- Click on the **Date/Load Number** of interest.
- Click on **OK**.

Note that the **Selection List** screens may also be accessed at any time using the **scroll** buttons to the right of the display fields; however, if these buttons are used and only one piece of information exists for the field selected, a warning similar to that shown below (Figure 43) will be displayed. The user must respond by clicking the **OK** button.

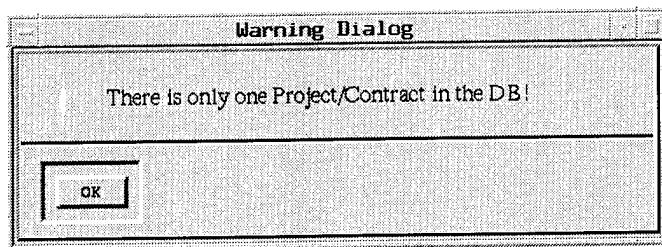


Figure 43. **Warning Dialog** box

A completed **Trip Report Panel** screen is shown in Figure 44. Confirm the displayed information and click on **OK** to display the report.

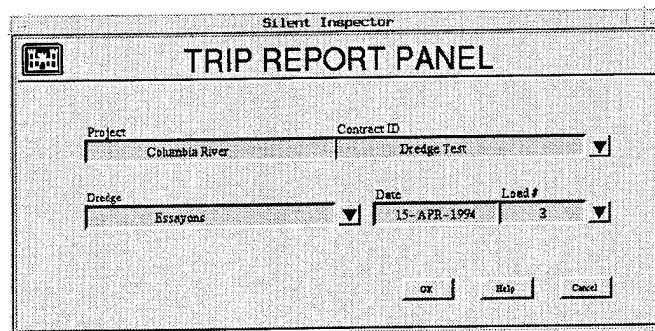


Figure 44. **Completed Trip Report Panel** screen

All trip, daily, or job reports selected by the user will be displayed as shown in Figure 45. The **Report Display** screen allows the user to view and print the report. There is no capability to edit the report, as it is automatically calculated based on the data contained in the SHIP database. The user may perform the following functions:

- View next or previous pages.
- Change the viewing scale on the monitor by preset amounts with the **Zoom In**, **Zoom Out** buttons.
- Return to a full-page view of the report.

- Print the report (all pages).
- Print the page shown on screen.
- Close the report display screen, and return to the **Trip Report Panel** screen.

When the zoom-in feature is in use, horizontal and vertical scroll buttons allow the user to review all areas of the page.

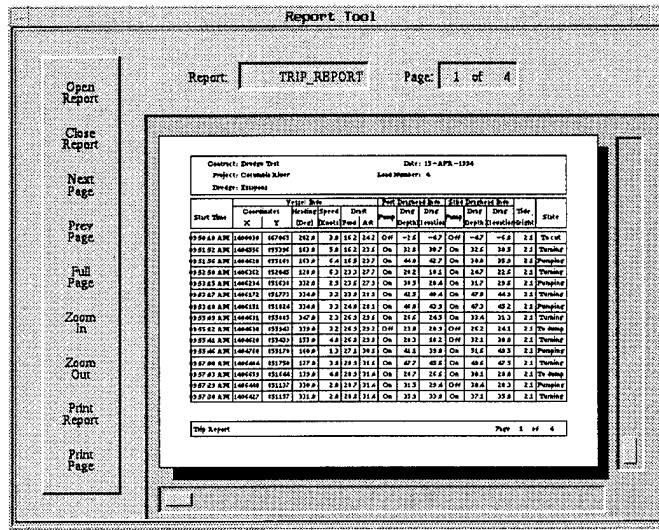


Figure 45. Report Display screen

When finished viewing or printing trip reports:

- Click on **Close Report** on the Report Display screen to return to the **Trip Report Panel** screen.
- Click on **Cancel** on the **Trip Report Panel** screen to return to the **Standard Reports** main menu screen.

**Select and print a daily report.** Selection, viewing, and printing of a daily report are nearly identical to those for a trip report:

- Click on the **Standard Reports** icon on the system's main menu screen.
- Click on the **Daily Report** icon on the **Standard Reports** main menu screen (see Figure 40).

The **Daily Report Panel** screen (Figure 46) works identically to the **Trip Report Panel** screen, with the exception that the user selects the date of interest rather than the trip of interest for a particular combination of project name, contract ID, and dredge. If only one piece of information is available in the

database for each item shown on this screen, these items will automatically appear within their respective boxes. A **Selection List** screen will appear when there is more than one entry for any of these items. The **Selection List** screens work identically to those for the trip report.

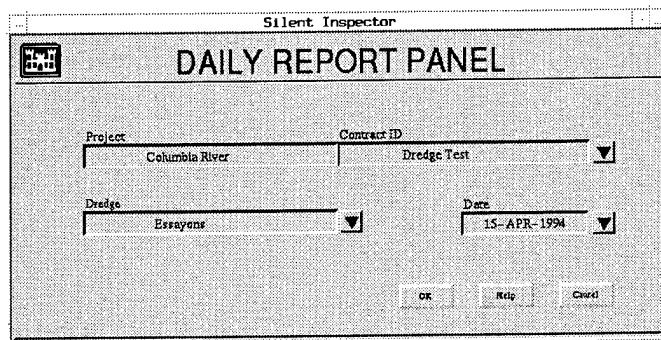


Figure 46. **Daily Report Panel** screen

Once a daily report selection has been made:

- Confirm the project and date selection, and click on **OK**. The **Daily Report** display screen will appear.

The **Daily Report** display screen is identical to the **Trip Report** display screen, with the exception of the different formats of the two reports. All screen operations are identical.

When finished viewing or printing daily reports:

- Click on **Close Report** on the **Daily Report** display screen.
- Click on **Cancel** on the **Daily Report Panel** screen to return to the **Standard Reports** main menu screen.

**Select and print a job report.** Selection, viewing, and printing of a job report are performed the same way as for the trip and daily reports, except that the user must define the end date for which the job report should be created. This enables the user to look at the entire project to date or through a user-selected date. The start date of the report is always the first day for which there are data within the database. The minimum job report time period is 1 day. All trips started during the days selected will be contained in the job report.

To select, view, and print a job report:

- Click on the **Standard Reports** icon on the system's main menu screen.
- Click on the **Job Report** icon on the **Standard Reports** main menu screen (see Figure 40) to reach the **Job Report Panel** screen (Figure 47).

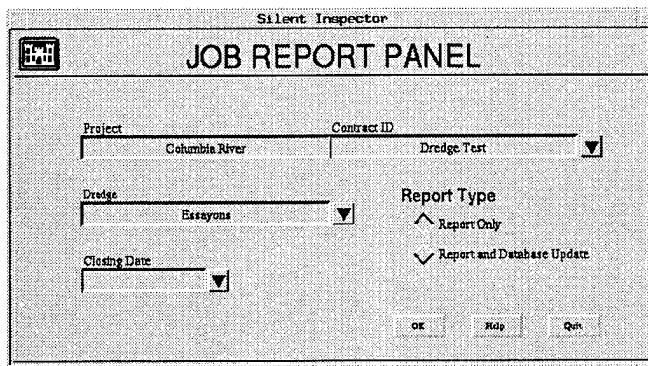


Figure 47. **Job Report Panel** screen

The **Job Report Panel** screen displays information concerning the project name, dredge name, and contract ID the same way the **Trip and Daily Report Panel** screens do. **Warning Dialog** boxes are also the same. In addition, the screen allows the user to select the closing date of the job report. To enter the report closing date:

- Click on the **Closing Date** box and the **Prompt Dialog** panel (Figure 48) will be displayed.
- Enter the date as YYMMDD or YY/MM/DD, with Y = year, M = month, and D = day.
- If the closing date is entered incorrectly, a warning dialog box will appear indicating the date was entered incorrectly. The user must respond to this **Warning Dialog** box by clicking on the **OK** button.

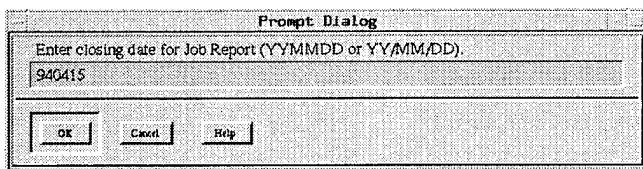


Figure 48. Prompt dialog screen showing correct format for entering the closing date on the **Job Report Panel** screen

- Reenter the closing date, and click on **OK**. This returns the user to the **Job Report Panel** screen.

After entering the closing date:

- Click on the **Report Only** button to view and/or print the report.

- Click on **Report and Database Update** button to generate the report and update the database table that maintains the project summary information used to generate the report.
  - Click on **OK**. The **Job Report Display** screen will appear.

The display screen for the **Job Report** (Figure 49) is identical in use to the **Trip** and **Daily Report Display** screens.

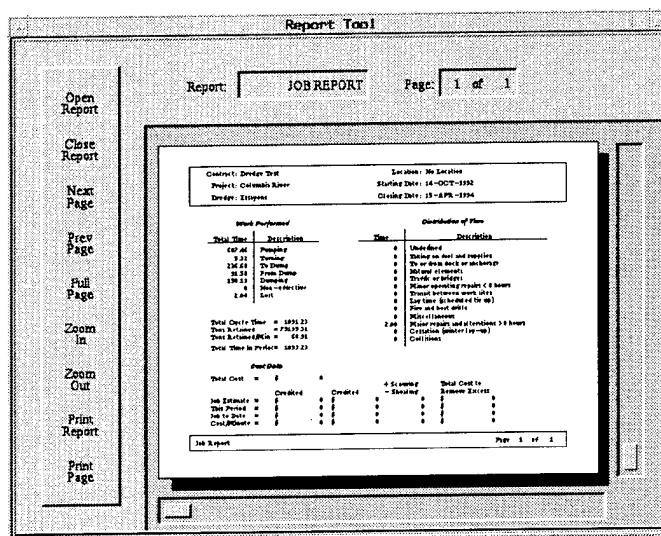


Figure 49. Job Report Display screen

When finished viewing or printing job reports:

- Click on **Close Report** on the **Job Report Display** screen.
  - Click on **Cancel** on the **Job Report Panel** screen to return to the **Standard Reports** main menu screen.

A cost information input screen does not exist at this time; therefore, the cost information field will remain either blank or zero on the job report.

## Data Display

Display of data collected by SHIP is possible using the plotting module. This module allows dredging inspectors to display data contained within the SHIP database so they can confirm the system's proper calculation of the dredge state at any particular time, review overall trends in the data, and compare various pieces of data.

The plotting module provides for plots of data values versus time called time history plots. They can be created for data from any project residing within the SHIP database.

### Create time history plots

To access the plotting module:

- Click on the **Plotting** icon on the system's main menu screen (see Figure 9). The **Plot Selection** screen (Figure 50) will appear.

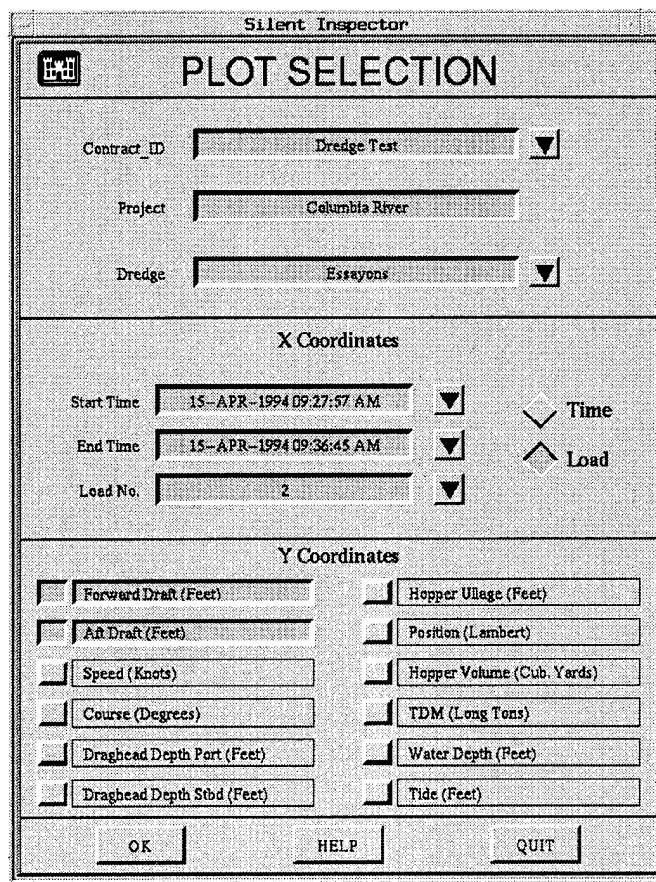


Figure 50. **Plot Selection** screen

This screen allows the user to select the project, dredge, data, and time period or trips of interest to plot. To operate this screen:

- Click on the **Contract ID** scroll button to select the project/contract ID of interest.
- Click on the **Dredge** scroll button to select the dredge of interest for the selected project/contract ID.

- Click on the **Time** or **Load** button to indicate if data are to be selected for plotting by time period or by load (trip) number.
- If data are plotted for a selected time period, click on the **pull-down** button to the right of the **Start Time** field and a **Prompt Dialog** box will be displayed.
- Enter the desired start date and time in the **Prompt Dialog** box and click on **OK**.
- Click on the **pull-down** button to the right of the **End Time** field, and a **Prompt Dialog** box will be displayed.
- Enter the desired end date and time in the **Prompt Dialog** box and click on **OK**.
- If data are plotted for a selected load, click on the **pull-down** button to the right of the **Load No.** box, and the list of loads will appear (Figure 51).
- Use the **scroll** button to select the load number, and click on it to select it. This will automatically enter the start and end date and time of that load (trip) into the **Start Time** and **End Time** boxes and the load number in the **Load Number** box.

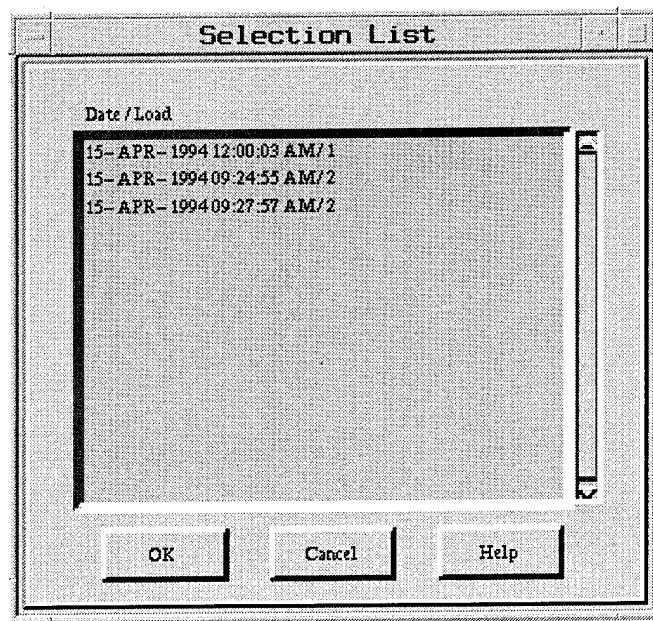


Figure 51. Trip start time/load number **Selection List** screen

The user may select to view data over a single trip (load) or a time range that encompasses many trips or only part of a trip.

- Click on the type of data to be plotted.

On the plotting screens, the X axis is time and the Y axis gives data values. Data having the same units may be selected for plotting on the same plot. Up to four types of data may be plotted on the same plot. However, only data types having the same units may be plotted together. If the user clicks on data types having different units, a **Warning Dialog** box will appear, indicating that the data types selected are not compatible for plotting. If all parameters are correct:

- Click on **OK** to create and view plot (Figure 52).

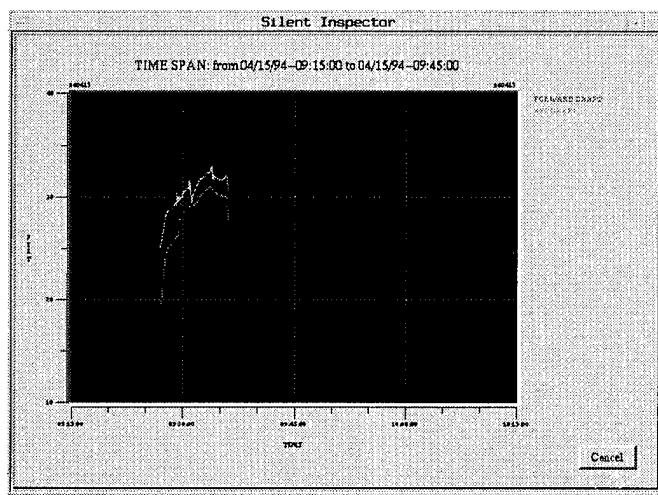


Figure 52. **Time History Plot** screen

Data values will now be plotted on the computer screen. Time is shown on the X axis in hours/minutes/seconds. The units and range of values for the data are displayed along the Y axis. While the user can control the scaling of the X axis by varying the time period, the scaling of the Y axis is performed automatically by the **Plotting** module and cannot be altered by the user. The time interval displayed is also listed at the top of the plot. The parameters plotted, and the legend which attributes these parameters to the various lines on the plot, are shown outside the upper right corner of the plot. Each parameter is assigned a different color.

### Print a plot

The **Plotting** module does not permit the user to print out the plots displayed on the screen.

## Save a plot

The **Plotting** module does not permit the user to save the plots displayed on the screen to plot files.

## Exit a plot

To exit a plot screen and return to the **Plot Selection** screen:

- Click on the **Cancel** button.

To return to the system's main menu:

- Click on the **Quit** button on the **Plot Selection** screen.

# Data Backup, Archiving, and Transfer

SHIP provides two operations, **Backup** and **Archive**, for copying data from its database to external files. **Backup** enables SHIP to resume operating after a catastrophic database loss. Restoring the database from a backup tape places the database in as near current a state as possible. **Archive** removes old data from the SHIP database, storing it in a format for transmission to SHORE units and permanent storage. **Backup** is automatic; **Archive** is partially automatic and partially initiated by the user.

## Data backup

If a disk failure or software corruption causes loss of a SHIP database, the database can be recovered from backup files. Although creation of backup files is automatic, restoring the SHIP database using the backup files must be user-initiated. The entire backup process is described below so that the user will understand both the automatic and user-initiated processes involved, and be able to monitor the system to ensure that the required files are being created correctly.

**Backup types and frequency.** There are two types of automatic backup operations: database backup and transaction log backup. The file created by a database backup includes the entire SHIP database, whereas the file created by a transaction log backup includes only data added to the SHIP database since the last transaction log backup. The backup function automatically copies the entire database once a week, and the transaction log data once a day. These frequencies may be adjusted, but only by a systems engineer.

**Backup files.** As noted above, there are two types of backup files: Database backup files, and transaction log backup files. Database backup files are named *yyyymmddX.dbd*, where *yyyymmdd* represents the computer's numeric encoding for the date the backup was performed (e.g., 19940411 for April 11,

1994), and X is a character suffix (a, b, c, d, etc.) used to sequence database backups made on the same day. The system can handle multiple backups on the same day because, during the archiving operation described later, backups occur before and after the actual archive process is performed.

Transaction log backup files are named yyymmddX.tld, with name components the same as for database backup files. A database backup file with the same yyymmddX component as a transaction log backup file *follows* the transaction log backup (i.e., the transaction log backup is an incremental backup from the *previous* database backup, not from the database backup with the same name). The yyymmddX component of the first transaction log backup file following a database backup will have the next higher suffix letter X.

One previous cycle of database and transaction log backup files is maintained as the backup process automatically deletes older files. Both types of files are stored under a computer directory given by the value of the environment variable DOSIS\_BACKUP.

**Set backup parameters and initiate backup.** The backup function is pre-programmed to operate as described above, and no user interaction is required for the two backup procedures to operate normally. If the time interval between either database backup or transaction log backup operations needs to be adjusted, this must be performed within the backup software code by a systems engineer. Additional information is provided within the system's technical reference manual.

**Restore database from backup files.** Under normal operating circumstances, it should never be necessary to restore the SHIP database from the backup files. Recovery from software crashes and power losses does not typically corrupt the SHIP database, nor involve use of the backup files; the database remains correct on the computer's hard disk. It is necessary to recover the SHIP database from the backup files only if the database becomes corrupted or if the disk itself is lost or damaged. The recovery process automatically determines which backup files must be loaded, and loads them in the correct order (database backup file, then sequential transaction log backup files).

No user screen exists to recover the database from the backup files process. This must be performed using Unix commands.

To initiate the recovery process:

- Access the Unix main screen (background screen) by clicking the right mouse button while the pointer is outside the SI user screens.
- Click on **K-Shell** from the displayed Unix menu, and a window will be opened.
- Type the command: **dosis\_restore**.
- Click on the upper left corner of the window to close the window.

This command should only be used when absolutely necessary because the backup files being loaded into the SHIP database will overwrite any data in the database. The database will then be current only to the last record contained in the backup files. New data within the SHIP database collected since the last record in the backup files will not be maintained within the database when the backup files are recovered into the database.

## **Data archiving**

The archive function automatically removes old data from the SHIP database by copying it to Unix files maintained on the computer's hard drive. These archive files may then be copied to streaming tape or other medium for storage and/or transmittal to shore sites. Although creation of the archive Unix files is automatic, user action is necessary to copy the Unix files to tape or other medium and to load these files in a SHORE unit. The user can also initiate the creation of archive files. The following subsections describe these actions, as well as where archived files are stored.

Only those tables within the SHIP database that receive and store data inputs from the DSS, and data computed by SHIP, are copied to Unix files using the archive function.

**Archiving frequency.** Data from the SHIP database are archived in Unix files once a month. The frequency of the automatic archiving may only be adjusted in the archiving module software by a systems engineer. The automatic process copies the data to Unix files, and deletes the copied data from the SHIP database. The user may also force the archive process of downloading data to Unix files to occur at any time.

**Archive files.** Archived data are stored in Unix files named yyyyymmddXXX.ad. Each file contains data from one database table, and the XXX characters within the file name designate that table. The following table indicates the XXX suffix characters for the six database tables archived during the archiving process:

Database Table Name	File Name Suffix
DOWNTIME	DWN
DREDGING_DATA	DDA
LOAD_DISPOSAL_AREA	LDA
LOAD_STATION	LST
LOAD_TABLE	LDT
STATE	STA

Note that these are the tables that are dynamically updated when new data arrive from a DSS unit. The other tables within the database are only infrequently manually updated via the **Setup** function. Information in those tables is not automatically archived, and must be downloaded and passed between the SHIP and SHORE units using other means.

The archived Unix files are stored in the computer directory indicated by the value of the environment variable DOSIS\_ARCHIVE until they are downloaded to tape.

**Forcing the archive process.** Under normal operating circumstances, it should never be necessary to force the archive process, unless the user wants to obtain all data within the SHIP database since the last automatic archive event in order to transfer it to a SHORE unit. No user screen exists to force the archive process. This must be performed using Unix commands.

To initiate the archive process:

- Access the Unix main screen (background screen) by clicking the right mouse button while the pointer is outside the SI user screens.
- Click on **K-Shell** from the displayed Unix menu, and a window will be opened.
- Type the command: **dosis\_archive**.
- Click on the upper left corner of the window to close the window.

This will cause the Unix files described in the preceding section to be written, and the archived data to be removed from the database. Data are archived through the previous day. The current day's data are not archived because archiving would disrupt the system's ability to calculate the daily report.

Archiving data removes this data from the SHIP database. As a result, the user can no longer create trip and daily reports for trips or days which have been archived. Creation of a job report will now begin with the first data values remaining in the SHIP database, not data from the beginning of the project.

**Copying archived unix files to tape.** Archived Unix files may be left on disk, but must be copied to tape or other medium to transmit to SHORE sites before removing them from disk. The following Unix command is provided to create a tape of all Unix files archived on the same date:

- **dosis\_tape yyyymmdd dev**

where yyyymmdd is the year/month/day the archive was taken (e.g., 19940411 for April 11, 1994) and dev is the name of the tape device (without the preceding /dev/) to which to copy the archive files. If the yyyymmdd parameter is omitted, the oldest set of archived files is copied to tape. If the dev parameter is omitted, the value of the environment variable DOSIS\_TAPE is used.

The dosis\_tape command does not remove the archive files from disk, in case it is desired to make several tape copies of the files. The procedure in the next section must be followed to remove archived files from disk.

**Deleting archived unix files from the ship hard drive.** After archive files have been copied to tape, they may be deleted by issuing the Unix command:

- `dosis_clean yyyyymmdd`

where `yyyyymmdd` is the year/month/day the archive was taken. This command will delete all archive files created on that date, so ensure that the files have already been safely copied to tape. If `yyyyymmdd` is omitted, the oldest set of archived files is deleted.

**Loading archived files into SHIP or SHORE.** Upon receipt of an archive tape, either a SHIP or SHORE unit can load the archived files into their database with the command:

- `dosis_load dev`

where `dev` is the name of the tape device (without the preceding `/dev/`) from which to load the archive files. If the `dev` parameter is omitted, the value of the environment variable `DOSIS_TAPE` is used. The tape to be loaded must have been previously written through use of the `dosis_tape` command.

### **Data transfer**

The SI system can only transfer data between SHIP and SHORE components by manually carrying the archived files on tape medium to the location of the SHORE unit. The files must then be loaded into the SHORE unit using the proper tape drive and the above procedures.

# 6 Operating the SHORE Component

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The SHORE component of the SI system is designed to accept previously recorded data from SHIP databases and allow the user to recreate standard reports and display the recorded data through the system's plotting module. The SHORE component can input data from multiple SHIP units, and therefore multiple projects. The reporting and data display capabilities of the SHORE system are identical to those in the SHIP system, with the exception that standard reports are not created automatically, as no real-time dredging activity is being monitored. Likewise, the SHORE component has no real-time data logging and monitoring module, and will not communicate with a DSS unit. Downtime events calculated by SHIP units can be displayed and annotated.

## Starting SHORE

To start SHORE:

- Turn on the SHORE computer. At this point the Unix software will begin operating, but the SI software will not yet be running. The SI software must be accessed using the following Unix log-on procedure.
- Type **dosis** (the present Unix user ID) in response to the Unix prompt **Logon:**.
- Type **adasoft** (the present Unix user password) in response to the Unix prompt **Password:**.

The user ID and password may be changed by the system administrator, as outlined in Chapter 3, so the user ID and password currently in use should be verified. After the proper user ID and password are entered, the first SHORE screen will appear containing two icons: a **Manuals** icon to access the user manual on the computer, and a **DOSIS** icon to access the SHORE system software. This screen appears identical to the DSS/SHIP component first screen (Figure 4).

To access the SHORE component's main menu screen (Figure 53):

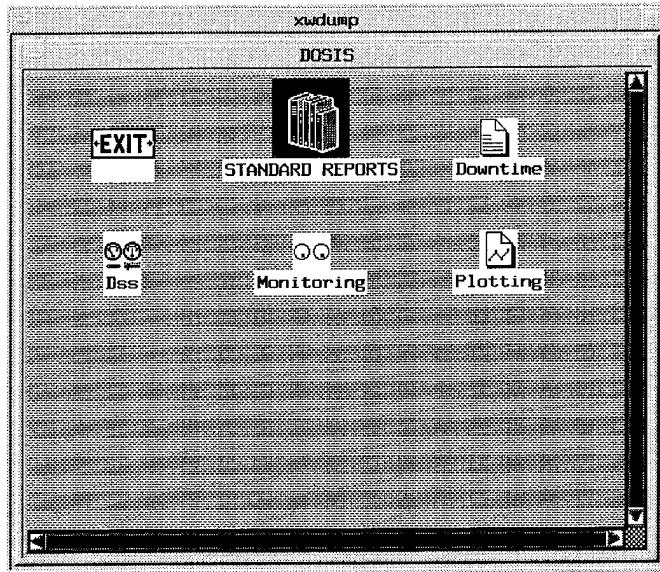


Figure 53. SHORE main menu screen

- Click on the **DOSIS** icon.

The SHORE main menu screen is identical to the DSS/SHIP main menu screen, except that no icons and associated functions exist within the SHORE component for the DSS component, and the **Setup** and **Monitoring** functions within the SHIP component. These icons, shown in Figure 53, would be removed from the SHORE main menu. In addition, an icon will be added to allow input of archived SHIP databases into the SHORE component.

To access the individual modules:

- Click on the **Data Input**, **Reports**, **Plotting**, or **Downtime**, icon of interest.

The main screen for the selected module will appear. Use of the screens within each module is discussed in the following sections.

## Data Input

Archived SHIP database files are loaded into the SHORE component using the same methods as for the SHIP component, as described in Chapter 5. Upon receipt of an archive tape, the archived files can be loaded into SHORE with the Unix command:

- `dosis_load dev`

where **dev** is the name of the tape device (without the preceding **/dev/**) from which to load the archive files. If the **dev** parameter is omitted, the value of the

environment variable DOSIS\_TAPE is used. The tape to be loaded must have been previously written through use of the dosis\_tape command.

Multiple SHIP databases may be loaded into a SHORE unit. As each set of project data within all the SHIP databases should have a unique set of project name, dredge name, and contract ID, each data set will maintain its uniqueness within the SHORE component.

If the user attempts to reenter an archived data set which has already been entered into the SHORE component, the system will automatically recognize the duplication, and will not allow the process to continue. An error message to this effect will be provided to the user. A new archived data set may be loaded by again typing the dosis\_load dev command.

## **Downtime Review and Annotation**

The SHORE unit cannot calculate downtime events from measured data. It simply displays downtime events determined by SHIP units. Downtime events computed and recorded by SHIP may be reviewed and annotated the same way within SHORE. Follow the instructions within the “Downtime” section in Chapter 5 to view and annotate downtime events, or edit previously entered downtime causes and comments.

## **System Reports**

The SHORE component creates and prints the same reports generated by the SHIP unit. These reports are not generated automatically because there is no real-time data collection from a DSS unit occurring. The reports must be initiated by the user the same way reports are user-initiated within the SHIP unit. See the “User Selection of Standard Reports” section in Chapter 5 for detailed user instructions.

## **Data Display (Plotting)**

The SHORE component creates the same time history and map plots as those generated by SHIP. The plots must be initiated by the user the same way plots are generated within SHIP. See the “Data Display” section in Chapter 5 for detailed user instructions.

## **Data Archiving**

Data within a SHORE database have been entered from previously archived data files; therefore, the data do not need to be re-archived for permanent storage. The user may re-archive the data within SHORE, or delete them from

the database, by following the archiving instructions for forcing an archive and deleting data, listed within the “Data Backup, Archive, and Transfer” section of Chapter 5.

# 7 Quick Reference

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This chapter is designed to provide the user with a brief listing of the purpose and actions needed to operate the various features and functions of the SI system for hopper dredges. Descriptions are grouped by the system component (DSS, SHIP, SHORE) in which they occur. General commands and actions are grouped separately. Actions are listed alphabetically within each grouping. More complete descriptions of all actions are provided in the previous chapters.

## General Commands and Actions

The following are general actions which are used with screens within all components of the SI.

### **Cancel**

*Purpose:*

To void all changes that have been entered into a data screen, and return the user to the previous screen.

*How:*

Place mouse arrow on **Cancel** button; click left mouse key.

### **Close**

*Purpose:*

To close a screen, removing it from view.

*How:*

Place mouse arrow on the small button within the top bar in the upper left corner of the screen; click left mouse key.

### **Help**

*Purpose:*

To access on-line help descriptions on any item related to the screen displayed.

*How:*

To access the **Help** menu for the screen displayed:

- 1) Place mouse arrow on **Help** button, usually located at the lower right corner of a screen; click left mouse key, and a list of topics will appear.
- 2) Place mouse arrow on topic of interest; click left mouse key to display help information.

## **Maximize screen**

*Purpose:*

To enlarge a screen within the computer window to full size.

*How:*

Place mouse arrow on the right small button within the top bar in the upper right corner of the screen; click left mouse key.

## **Minimize screen**

*Purpose:*

To close a screen and place it as an icon at the bottom of the computer screen.

*How:*

Place mouse arrow on the left small button within the top bar in the upper right corner of the screen; click left mouse key.

## **OK**

*Purpose:*

Accepts data entered on a user screen and enters the data into the system database or system program as needed.

*How:*

Place mouse arrow on **OK** button, and click.

## **Open**

*Purpose:*

To open and use different system features and functions.

*How:*

Double click on the icon of the feature or function to be opened.

## **Pull-down button**

*Purpose:*

To show a list of items which have been previously entered into the SHIP database for the data entry box associated with the **pull-down** button, so that a selection of the desired item may be made.

### *How:*

The **pull-down** buttons are located to the right of a data entry box or field. When a pull-down button is present, information cannot be directly entered into the data entry box using the keyboard; instead it must be selected from a list of previously entered items displayed when the pull-down button is used. To make a selection:

- 1) Place the mouse arrow on the **pull-down** button, and click the left mouse key.
- 2) Place the mouse arrow on the desired item, using the **scroll** button if necessary to locate the item.
- 3) Click on the left mouse key. The item will now be displayed in the data entry box.

## **Scroll button**

### *Purpose:*

To scroll through a list of previously entered items contained within a selection list screen to find the item of interest.

### *How:*

Two **scroll** buttons are provided at the right side of each selection list screen, to allow scrolling the list either up or down. A slide bar, which may also be used to move through the list, is located between the two buttons. To use the buttons:

- 1) Place the mouse arrow on the up or down **scroll** button.
- 2) Click on the left mouse key. Continuing to press on the key keeps the list scrolling until it reaches the top or bottom of the list. Releasing the key stops the motion of the list.

## **Slide bar**

### *Purpose:*

To move quickly through a list of previously entered items contained within a selection list screen to find the item of interest.

### *How:*

The **slide bar** is located at the right side of each selection list screen between the up and down scroll buttons. A button on the slide bar shows the location presently displayed within the list. If the list is completely displayed on the screen, no button will appear in the slide bar, and the slide bar will be inactive. If the bar is active:

- 1) Place the mouse arrow at a point along the slide bar, either above or below the **slide bar** button, and click on the left mouse key to have the screen move the display to that location within the list; or
- 2) Place the mouse arrow on the **slide bar** button, click on the left mouse key and continue to hold the key down while you slide the button to a new location. The display will then move to that location within the list.

# DSS Component

## Contract ID

### *Purpose:*

The contract ID is the Army Corps of Engineers contract number for a project. The combination of the project name/contract ID is the unique identifier by which all data within the SI and database are labeled, tracked, and recovered.

### *How:*

Using the **Entry Panel** screen, the contract ID is entered into the DSS, and tagged to outgoing data, as follows:

- 1) Click on the **Contract ID** data entry box.
- 2) Type in the contract number.
- 3) When the **Start** button is pushed, all data outgoing to the SHIP database will be tagged with this contract ID number.

## Data source (data entry box)

### *Purpose:*

To select between real-time incoming data, or recorded data files, as the source of the data sent on to the SHIP database.

### *How:*

Using the **Entry Panel** screen, the data source is entered as follows:

- 1) Leave the box blank to select real-time incoming data as the data source, or
- 2) Click on the **Data Source** box.
- 3) Enter the computer drive, directory, and file name of the recorded data, and press the **ENTER** key.

## Data status buttons

### *Purpose:*

Data read, displayed, and passed to the DSS are compared against a set of minimum and maximum values, and the status of the data is determined to be OK, low, high, or missing. Status of data displayed in the control panel is signified by the background color in the data display boxes. Data status buttons to the right of the displayed data on the **Control Panel** screen can be used to force the DSS to send the SHIP database data which are low, high, or missing, instead of the actual data the DSS is reading from a real-time source or recorded data file.

### *How:*

Place the mouse arrow on a **LO**, **HI**, or **NO** button; click on the left mouse key.

## **Dredge name**

### *Purpose:*

Dredge name is the name of the dredge used on a project. Dredge name also helps identify unique data sets within the SI database.

### *How:*

Using the **Entry Panel** screen, the dredge name is entered into the DSS, and tagged to outgoing data, as follows:

- 1) Click on the **Dredge Name** data entry box.
- 2) Type in the dredge name.
- 3) When the **Start** button is pushed, all data outgoing to the SHIP database will be tagged with this dredge name.

## **Exit DSS**

### *Purpose:*

To exit the DSS program.

### *How:*

On the **Entry Panel** screen, click on the **Quit** button.

## **Project name**

### *Purpose:*

The project name is the Army Corps of Engineers name for a project. The combination of the project name/contract ID is the unique identifier by which all data within the SI and database are labeled, tracked, and recovered.

### *How:*

Using the **Entry Panel** screen, the project name is entered into the DSS, and tagged to outgoing data, as follows:

- 1) Click on the **Project Name** data entry box.
- 2) Type in the project name.
- 3) When the **Start** button is pushed, all data outgoing to the SHIP database will be tagged with this project name.

## **Start DSS**

### *Purpose:*

To start the DSS operating.

### *How:*

Perform the following:

- 1) Turn on computer, and Unix software will begin operating.
- 2) When **Logon:** is displayed, type **dosis**
- 3) When **Password:** is displayed, type **adasoft**, or other current password approved by the system administrator. The opening **DOSIS** screen will now appear.

- 4) Click on the **DOSIS** icon. The **DOSIS** main menu screen will appear.
- 5) Click on the **DSS** icon. The **DSS Entry Panel** screen will appear.
- 6) Complete the **Entry Panel** screen inputs, click on the **Start** button, and DSS will begin operating.

### **Stop DSS**

*Purpose:*

To stop the DSS from operating.

*How:*

On the **Control Panel** screen, click on the **Stop** button.

### **Timer input**

*Purpose:*

To select between the time and date associated with incoming data, or a user-defined time, to be inserted with the data into the SHIP database.

*How:*

Using the **Entry Panel** screen:

- 1) Click on the **Data Source** button to select the use of the time and date arriving with incoming data, or
- 2) Click on the **User-Defined** button to overwrite the incoming time and date.
- 3) Click on the **slide bar**, and set the time interval between the times attached to the outgoing data. The first incoming time and date will remain unchanged and attached to the outgoing data; however, all times thereafter will be overwritten based on the time attached to the last data entered into the SHIP database plus the number of seconds selected as the time interval between data values. The default time interval is 10 sec.

## **SHIP and SHORE Components**

### **Archive data**

*Purpose:*

To download data from a SHIP database to Unix files and then to other storage medium, both for permanent record keeping and for transfer to SHORE units.

*How:*

Transfer of SHIP database to archive Unix files is performed automatically once per month. The user may also initiate this action as follows:

- 1) Click on the right mouse button while the mouse arrow is outside all SI screen windows to access the main Unix screen.
- 2) Click on the **K-Shell** displayed on the Unix main screen menu, which opens a window.
- 3) Type: **dosis\_archive**

To copy archive Unix files from the SHIP hard disk to tape or other medium:

- 1) Access the Unix window (see above)
- 2) Type: **dosis\_tape yyyymmdd dev**  
where **yyyymmdd** is the year/month/day the archive was made (e.g., 19940411 for April 11, 1994) and **dev** is the name of the tape device (without the preceding `/dev/`) to which to copy the archive files. If the **yyyymmdd** parameter is omitted, the oldest set of archived files is copied to tape. If the **dev** parameter is omitted, the value of the environment variable **DOSIS\_TAPE** is used.

To delete archive Unix files that have been copied to tape from the SHIP hard disk:

- 1) Access the Unix window (see above).
- 2) Type: **dosis\_clean yyyymmdd**  
where **yyyymmdd** is the year/month/day the archive was made. If **yyyymmdd** is omitted, the oldest set of archive Unix files is deleted.

To load archived files from tape or other medium into a SHORE or SHIP database:

- 1) Access the Unix window (see above).
- 2) Type: **dosis\_load dev**  
where **dev** is the name of the tape device (without the preceding `/dev/`) from which to load the archive files. If the **dev** parameter is omitted, the value of the environment variable **DOSIS\_TAPE** is used. The tape to be loaded must have been previously written through use of the **dosis\_tape** command.

## Backup data

### *Purpose:*

To provide a backup set of data in order to recover the SHIP database if the database becomes corrupted or if the hard disk is lost or damaged.

### *How:*

Backup files are created automatically. The files created and their frequency are:

- 1) Database backup files: entire database once per week.
- 2) Transactions log files: new data since last database backup, performed once per day.

To restore a database within SHIP using the backup files:

- 1) Access the Unix window as for **Archive Data**.
- 2) Type: **dosis\_restore**

## **Downtime**

### *Purpose:*

To assign time during a dredging project to lost or noneffective time categories presently used by the Army Corps of Engineers for activities not directly related to active dredging and disposal operations.

### *How:*

Downtime events contained within the SI database are presently determined automatically by the SHIP component. No user input of a downtime event is currently permitted. The user may review computer-determined downtime events, assign them to lost time or noneffective time categories, and add comments concerning each downtime event. To review or annotate downtime events:

- 1) Click on the **Downtime** icon on the main menu screen. The **Downtime Selection** screen will appear.
- 2) Select the **Project**, **Dredge**, and **Contract ID** of the downtimes of interest using the pull-down buttons.
- 3) Click on the **Cause Not Specified** button to display all downtime events for that project and dredge for which no cause has been attributed, or click on the **All** button to display all downtime events related to that project.
- 4) Click on the **OK** button and a list of the date, time, and load number of each downtime event will appear.
- 5) Click on the downtime event of interest, and click on **OK**. The **Downtime Input** screen will appear.
- 6) Click on the button for the appropriate downtime event cause (only one button may be selected per event).
- 7) Click on the **Comments** box to enter any comments up to 255 characters in length.
- 8) Click on **OK** to enter the information and return to the **Selection List** screen.

## **Dredge state**

### *Purpose:*

To assign a dredge's activities to one of seven pre-determined categories: dredging, turning, sailing to dump, dumping, sailing to dredging area, downtime, and pumping out material.

### *How:*

The dredge state is calculated automatically by the SHIP component. The user has no input into this calculation; the calculation may only be changed by a systems engineer. The user is able to assign downtime events to lost or noneffective time causes (see "Downtime").

## Monitor incoming data (SHIP component only)

### *Purpose:*

Display new data being inserted into the SHIP database by the DSS.

### *How:*

To see a display of the incoming data:

- 1) Click on the **Monitoring** icon within the main menu screen, and the **Dredging Operations** screen will appear. Incoming data and its status (OK, low, high, and missing) are displayed on this screen, along with the TDM quantity and dredge status computed by the SHIP component.

## Plotting

### *Purpose:*

To graphically display recorded data versus time for viewing by the user.

### *How:*

To create a plot:

- 1) Click on the **Plotting** icon on the main menu screen, and the Plot Selection screen will appear.
- 2) Click on the **Contract ID** box **pull-down** button to find and select the contract ID of interest.
- 3) Click on the **Project** box **pull-down** button to find and select the project name of interest.
- 4) Click on the **Dredge** box **pull-down** button to find and select the dredge name of interest.
- 5) Click on the **Time or Load** button to indicate whether data are selected for plotting by time period or by load (trip) number.
- 6) If the **Time** button is clicked on, select the start and end times of the data to be displayed by using the **pull-down** buttons and clicking on the start/end times of interest.
- 7) If the **Load** button is clicked on, select the load number by using the **pull-down** button and clicking on the load of interest. This will also automatically enter the start and end times of that load into the **Start Time** and **End Time** boxes.
- 8) Click on the type of data to be plotted. Up to four data types containing the same units may be plotted on the same plot.
- 9) If all parameters are correct, click on **OK**, and the plot will be displayed. The X axis (time) may be varied by changing the selected time period. The Y axis (data) is set automatically and cannot be altered.

## Reports

### *Purpose:*

To display summaries of recorded data in formats similar to trip (load), daily, and job reports currently used by the Army Corps of Engineers.

*How:*

Trip and daily reports are generated and printed automatically by the SHIP component at the end of each disposal activity for a trip report, and the end of each trip in a day for the daily report. The job report is not created until requested by the user. All three reports may be initiated by the user at any time. To create a trip report:

- 1) Click on the **Standard Reports** icon on the main menu screen.
- 2) Click on the icon representing the report of interest, and the **Report Panel** screen for that report will appear.
- 3) Select the **Project Name/Contract ID** pairing of interest using the **pull-down** button.
- 4) Select the **Dredge Name** of interest using the **pull-down** button.
- 5) For the trip report, select the **Date** and **Load Number** of interest using the **pull-down** button.
- 6) For the daily report, select the **Date** of interest using the **pull-down** button.
- 7) For the job report, select the **Closing Date** of interest using the **pull-down** button, and then click on the **Report Type** (report only, or report plus update the job report database).
- 8) Click on **OK**, and the selected report will be displayed on the **Report Tool** screen.
- 9) View different parts of the report using the scroll bars, and the display buttons shown on the screen.
- 10) When finished, click on the **Close Report** button to return to the **Report Panel** screens.

### **Setup: Crew member information**

*Purpose:*

To enter names and information on the crew of a dredge.

*How:*

To enter a new crew member:

- 1) Click on the **Setup** icon to access the **Setup** menu.
- 2) Click on **Add** under the **Crew Member** menu item, and the **New Crew Member Panel** will appear.
- 3) Enter the name and rank of the crew member, and click on **OK**.

To view or edit previously entered information:

- 1) Click on the **Setup** icon to access the **Setup** menu.
- 2) Click on **View/Edit** under the **Crew Member** menu item, and the **Edit Crew Member Panel** will appear.
- 3) Click on the **pull-down** button to the right of the **Crew ID** box to access a list of crew members already entered.
- 4) Click on the **Crew ID** of the crew member of interest.
- 5) View the data, or click on the data box to be edited. After completing all edits, click on **OK**.

To delete crew information:

- 1) Click on the **Setup** icon to access the **Setup** menu.
- 2) Click on **Delete** under the **Crew Member** menu item, and the **Delete Crew Member** panel will appear.
- 3) Click on the **pull-down** button to the right of the **Crew ID** box to access a list of crew members already entered.
- 4) Click on the **Crew ID** of the crew member to delete.
- 5) Click on **OK**, and a confirmation box will appear.
- 6) Click on **Yes**.

To assign a crew member to a dredge:

- 1) Click on **Assign** under the **Crew Member** menu item, and the **Crew Assignment Panel** will appear.
- 2) Click on the **pull-down** button to select a **Crew Member Name**.
- 3) Click on the **pull-down** button to select a **Dredge Name** to which the crew member is assigned.
- 4) Click on the **pull-down** button to select a **Project Name/Contract ID** to which the crew member is assigned.
- 5) Click on **OK**.

## **Setup: disposal areas**

*Purpose:*

To enter the name and boundary of dredged material disposal areas, and assign them to dredging projects.

*How:*

To enter a new disposal area:

- 1) Click on **Add** under the **Disposal Areas** menu item, and the **New Disposal Area Panel** will appear.
- 2) Enter the disposal area name.
- 3) Enter the coordinates of the upper left and lower right corners of a rectangle to describe the boundaries of the disposal area. Coordinates must be in the same units as those of the navigation data supplied by DSS to the SHIP database. Note that it may be necessary to define a disposal area boundary using multiple rectangles, each with its own name.
- 4) Click on **OK** to enter the information into the database.

To view or edit previously entered information:

- 1) Click on **View/Edit** under the **Disposal Areas** menu item, and the **Edit Disposal Area Panel** will appear.
- 2) Click on the **pull-down** button to access a list of disposal area names already entered.
- 3) Click on the disposal area name of interest.
- 4) View the data, or click on the data box you wish to edit. After completing all edits, click on **OK**.

To delete a disposal area:

- 1) Click on **Delete** under the **Disposal Areas** menu item, and the **Delete Disposal Area Panel** will appear.
- 2) Click on the **pull-down** button to access a list of disposal area names already entered.
- 3) Click on the disposal area name to delete.
- 4) Click on **OK**, and a confirmation screen will appear.
- 5) Click on **Yes**.

To assign a disposal area to a project:

- 1) Click on **Assign** under the **Disposal Areas** menu item, and the **Disposal Area Assignment Panel** will appear.
- 2) Click on the **pull-down** button to select a **Disposal Area Name**.
- 3) Click on the **pull-down** button to select a **Project Name/Contract ID** to which the disposal area is assigned.
- 4) Click on **OK**.

### **Setup: Dredging stations (areas)**

*Purpose:*

To enter the name and boundary of dredging areas, and assign them to a project. The dredging areas are called stations.

*How:*

To enter a new dredging station:

- 1) Click on **Add** under the **Stations** menu item, and the **New Station Panel** will appear.
- 2) Enter the station name.
- 3) Enter the coordinates of the upper left and lower right corners of a rectangle to describe the boundaries of the dredging area. Coordinates must be in the same units as those of the navigation data supplied by DSS to the SHIP database. Note that it may be necessary to define a dredging area boundary using multiple rectangles, each with its own name.
- 4) Click on **OK** to enter the information into the database.

To view or edit previously entered information:

- 1) Click on **View/Edit** under the **Stations** menu item, and the **Edit Station Panel** will appear.
- 2) Click on the **pull-down** button to access a list of station names already entered.
- 3) Click on the station name of interest.
- 4) View the data, or click on the data box to be edited. After completing all edits, click on **OK**.

To delete a dredging area:

- 1) Click on **Delete** under the **Stations** menu item, and the **Delete Station Panel** will appear.
- 2) Click on the **pull-down** button to access a list of station names already entered.

- 3) Click on the station name to delete.
- 4) Click on **OK**, and a confirmation screen will appear.
- 5) Click on **Yes**.

To assign a dredging area to a project:

- 1) Click on **Assign** under the **Stations** menu item, and the **Station Assignment Panel** will appear.
- 2) Click on the **pull-down** button to select a **Station Name**.
- 3) Click on the **pull-down** button to select a **Project Name/Contract ID** to which the station is assigned.
- 4) Click on **OK**.

## **Setup: Dredge information**

*Purpose:*

To enter information on dredges and assign them to dredging projects.

*How:*

To enter a new dredge:

- 1) Click on **Add** under the **Dredges** menu item, and the **New Dredge Panel** will appear.
- 2) Enter the dredge name, and other information requested. For definition of information to be entered, see Chapter 5.
- 3) When all information is entered, click on **OK** to enter the information into the database.

To view or edit previously entered information:

- 1) Click on **View/Edit** under the **Dredges** menu item, and the **Edit Dredge Panel** will appear.
- 2) Click on the **pull-down** button to access a list of dredge names already entered, and the information previously entered will appear.
- 3) View the data, or click on the data box to be edited and enter the new information. After completing all edits, click on **OK**.

To delete a dredge:

- 1) Click on **Delete** under the **Dredges** menu item, and the **Delete Dredge Panel** will appear.
- 2) Click on the **pull-down** button to access a list of dredge names already entered.
- 3) Click on the dredge name to delete.
- 4) Click on **OK**, and a confirmation screen will appear.
- 5) Click on **Yes**.

To assign a dredge to a project:

- 1) Click on **Assign** under the **Dredges** menu item, and the **Dredge Assignment Panel** will appear.
- 2) Click on the **pull-down** button to select a **Dredge Name**.
- 3) Click on the **pull-down** button to select a **Project Name/Contract ID** to which the dredge is assigned.

- 4) Enter information in the additional data boxes as needed.
- 5) Click on **OK**.

## **Setup: Landmarks**

### *Purpose:*

To enter the name and location of marine landmarks near or relevant to dredging projects.

### *How:*

To enter a new landmark:

- 1) Click on **Add** under the **Landmarks** menu item, and the **New Landmark Panel** will appear.
- 2) Enter the landmark name.
- 3) Enter the coordinates of the landmark. Coordinates must be in the same units as those of the navigation data supplied by DSS to the SHIP database.
- 4) Click on **OK** to enter the information into the database.

To view or edit previously entered information:

- 1) Click on **View/Edit** under the **Landmarks** menu item, and the **Edit Landmarks Panel** will appear.
- 2) Click on the **pull-down** button to access a list of landmark names already entered.
- 3) Click on the landmark name of interest.
- 4) View the data, or click on the data box to be edited. After completing all edits, click on **OK**.

To delete a landmark:

- 1) Click on **Delete** under the **Landmarks** menu item, and the **Delete Landmarks Panel** will appear.
- 2) Click on the **pull-down** button to access a list of landmark names already entered.
- 3) Click on the landmark name to delete.
- 4) Click on **OK**, and a confirmation screen will appear.
- 5) Click on **Yes**.

To assign a landmark to a project:

- 1) Click on **Assign** under the **Landmarks** menu item, and the **Landmarks Assignment Panel** will appear.
- 2) Click on the **pull-down** button to select a **Landmark Name**.
- 3) Click on the **pull-down** button to select a **Project Name/Contract ID** to which the station is assigned.
- 4) Click on **OK**.

## **Setup: Project information**

### *Purpose:*

To enter information about a dredging project for which data will be collected.

*How:*

To enter a new project:

- 1) Click on **Add** under the **Projects** menu item, and the **New Project Panel** will appear.
- 2) Enter the project name, and other information requested. For definition of information to be entered, see Chapter 5.
- 3) When all information is entered, click on **OK** to enter the information into the database.

To view or edit previously entered information:

- 1) Click on **View/Edit** under the **Projects** menu item, and the **Edit Project Panel** will appear.
- 2) Click on the **pull-down** button to access a list of project names already entered, and the information previously entered will appear.
- 3) View the data, or click on the data box to be edited and enter the new information. After completing all edits, click on **OK**.

To delete a project:

- 1) Click on **Delete** under the **Projects** menu item, and the **Delete Project Panel** will appear.
- 2) Click on the **pull-down** button to access a list of project names already entered.
- 3) Click on the project name to delete.
- 4) Click on **OK**, and a confirmation screen will appear.
- 5) Click on **Yes**.

## **Start SHIP or SHORE**

*Purpose:*

To start SHIP or SHORE operating.

*How:*

Perform the following:

- 1) Turn on computer, and Unix software will begin operating.
- 2) When **Logon:** is displayed, type **dosis**.
- 3) When **Password:** is displayed, type **adasoft**, or other current password approved by the system administrator. The opening **DOSIS** screen will now appear.
- 4) Click on the **DOSIS** icon. The **DOSIS** main menu screen will appear. SHIP or SHORE is now operating.

## **Security**

*Purpose:*

To ensure the integrity of data maintained within the system's database, and to also ensure user access to only pre-approved levels of operations within the system, as set by a system administrator and performed using user IDs and passwords.

*How:*

After turning on the computer, while in the Unix main screen:

- 1) Following the **Logon:** prompt, type the user ID (presently **dosis**).
- 2) Following the **Password:** prompt, type the user password (presently **adasoft**).

User IDs and passwords will be assigned by the local system administrator.

## **Setup**

*Purpose:*

To allow the user to input information related to the dredging project, Corps of Engineers District for which it is being performed, dredge being used, crew members, dredging areas, disposal areas, and local marine landmarks.

*How:*

To activate the **Setup** module:

- 1) On the **DOSIS** main menu screen, click on the **Setup** icon. The **Setup** main menu screen will appear.
- 2) Click on the main menu item of interest.
- 3) Click on the item of interest (**Add**, **View/Edit**, **Delete**, or **Assign**) under the main menu item selected.
- 4) Enter or modify information as directed under the specific topic heading (see these topic headings elsewhere in this quick reference section).

## **Tons dry measure (TDM)**

*Purpose:*

A calculation of the weight of the material dredged and retained in the hopper. In some cases, payment for dredging work may be made based upon this parameter rather than volumes of material dredged, time worked, or some other parameter.

*How:*

TDM is calculated automatically by the SHIP component based on an assumed specific gravity of individual sediment particles, the displacement of the vessel from one load to another, and volume curves of a vessel's hopper. This calculation cannot be changed except by a systems engineer.

# Appendix A

## Glossary

---

This section defines terms and phrases commonly used in association with dredging activities and the Silent Inspector (SI) system. Terms and phrases are in alphabetical order.

### **Agitated**

Term applied to material which is stirred up from the bottom and left to be carried away by the current, or moved downstream by a river. Such material has undergone agitation dredging.

### **Average distance to placement site**

One half the sum of the total number of miles run to the placement site and return to cut, for all loads properly disposed of, for the reporting period.

### **Average length of cut**

The sum of the length of all cuts made (in feet) in the reporting period divided by the number of cuts made.

### **Average length of load**

The sum of the length of all cuts made (in feet) in the reporting period divided by the number of loads made.

### **Crew members**

Names of the captain and crew members of the dredge.

### **Cut**

Each pass through a dredging area while conducting dredging. Several cuts are often required to collect a load of sediment to be transported to the dump site.

### **Cut number**

The number of the cut within the load that is being dredged if each cut is recorded on a separate line. Total number of cuts in the load if recording one load per line.

### **Cut length**

The distance in feet, to the nearest 10 ft, the dredge traveled to make one cut.

**Cut width**

The average width of cut in feet during this reporting period.

**Date**

Date, in terms of the local time zone used for each dredging project. In the Silent Inspector system, the date tagged to collected data generally comes from the DSS computer clock.

**Density of material in situ**

Density of material dredged prior to dredging, or in situ, in grams per cubic centimeter, as determined from representative samples taken preliminary to dredging and included in specifications.

**Disposal area**

Area where dredged material is disposed of, or dumped.

**District**

The name of the Corps of Engineers District for which the dredge is operating and under contract.

**Downtime**

Time when a dredge is not performing a part of the dredging cycle. Downtime is classified as either noneffective time or lost time.

**Draft**

Depth of the vessel below the waterline.

**Drag arms**

The pipes, when lowered to the bottom and the dredging pumps turned on, through which sediment is recovered and inserted into the hopper.

**Dredge**

Vessel used to collect sediment from the seabed.

**Dumping**

Disposing of a load at a disposal site. For hopper dredges this is most often accomplished by opening the hopper doors.

**Hopper**

The container within a hopper dredge into which the sediment/water slurry recovered from the seabed is pumped and held until dumped or pumped out.

**Hopper capacity**

Maximum capacity (in cubic yards) of the hopper in a hopper dredge.

**Hopper dredge**

A dredge which has a container, called a hopper, built into the vessel to hold the recovered sediment, so that it may transport and dispose of that sediment at a distant site.

**Load**

The quantity of material recovered in the hopper that is taken and disposed of at a disposal site. Each round trip (which includes dredging, transit to the disposal site, dumping, and transit to the dredging site) is called a completed load, or trip.

**Load number**

Each load has an individual number starting with number one for the first load on a specific project within the fiscal year, with following loads numbered consecutively throughout the project.

**Lost time**

That time when the dredge is conducting activities not directly associated with normal dredging operations. Lost time events used by the Corps of Engineers are:

***Collisions***

The actual time that normal dredging operations are not possible due to collisions. This item will not include any repair time for periods exceeding 8 consecutive hours (see "Major Repairs and Alterations").

***Lay time***

The actual time that the dredge is idle due to a lack of assigned work.

***Major repairs and alterations***

The actual time that the dredge is not operated for periods exceeding 8 consecutive hours in order to accomplish major repairs and alterations. The entire time that the dredge is undergoing shipyard repairs (including running to and from the shipyard and the dredging assignment) will be reported in this item. This does not include repairs accomplished during lay time.

***Mobilization/Demobilization***

Actual time (in minutes to the nearest minute) that is spent running between assignments, Districts, or lay time areas. Mobilization starts when the dredge leaves the previous project site or lay time area for the new project site. Demobilization starts when the dredge leaves the previous project site for the new project site or lay time area. Mobilization stops when pumping begins at the new project site. Demobilization stops when pumping begins at the new project site or when the dredge reaches the lay time area.

**Material**

Sediment collected during dredging operations.

**Material character**

The type and density of the majority of material dredged. This information is generally obtained from the predredging sampling, or sampling of the material after collection while in the hopper or a barge.

**Material classification**

The in situ quantity Unified Soil Classification System (USCS) classification (decimeters) in grams per cubic centimeter.

**Material hauled**

The quantity of material (in cubic yards) dredged and removed from the dredging site, and properly placed in the disposal area.

**Miles to dump and cut**

The miles travelled to the disposal and dredging sites, respectively. These distances are recorded in statute miles to the nearest tenth of a mile as scaled from suitable maps and/or charts or as provided by an electronic positioning system.

**Navigation and other aids**

Navigation ranges and electronic aids used during dredging operations.

**Noneffective working time**

That time when dredging is not occurring, but is normally associated with the dredging operation and thus is charged to the cost of doing work.

Noneffective working time events used by the Corps of Engineers are:

***Fire and boat drills***

Actual time that any element of the dredge cycle (i.e., loading, hauling, etc.) is lost or delayed for the purpose of conducting fire and boat drills.

***Launch operations***

Actual time that any element of the dredge cycle (i.e., loading, hauling, etc.) is lost or delayed for the purpose of launch operations. These include deploying the launch and transferring personnel, supplies, and/or equipment to and from the launch.

***Loss due to natural elements***

Actual time that dredging operations are not possible due to adverse natural elements (i.e., weather, sea, fog, ice). Any running time to and from an anchorage resulting from such conditions will be included.

***Loss due to traffic and bridges***

Actual time that dredging operations are not possible because of marine traffic or the dredge is stopped waiting for bridges to complete operations.

***Minor operating repairs***

Actual time that operation is interrupted for periods not exceeding 8 consecutive hours due to the necessity for making repairs. Any running time to and from wharf or anchorage that may be necessary for this

purpose, will be included. If the total time exceeds 8 hr, the first 8 hr will not be charged as minor operating repairs.

#### ***Miscellaneous***

Actual time of all interruptions or delays in the dredging or hauling operations not specifically covered in the preceding items of noneffective working time. A space will be furnished for a brief explanation under "Remarks" for any time reported under this item.

#### ***Taking on fuel and supplies***

Actual time that the dredge is inoperative due to taking on fuel and supplies, including time spent traveling to and from the wharf for this purpose.

#### ***Transferring between works***

Actual time spent traveling within a project (e.g., moving between different cuts on the same project).

#### **Minutes**

Dredging projects are tracked by the amount of time, per trip/day/job, spent performing different parts of dredging operations. These times are generally recorded in minutes. In addition to lost or noneffective time events, the following dredging activities are tracked by time:

#### ***Dumping***

Time spent dumping material, equal to the difference between the time dumping started and was completed.

#### ***Pumping/Turning***

Number of minutes spent pumping and turning during the dredging of an individual load.

#### ***To cut***

Time spent traveling to the cut, equal to the difference between the time the placement ended and the time the dredge resumed dredging (pumps on, drag arms in position for dredging).

#### ***To placement***

Time spent traveling to the placement site, equal to the difference between the time when the pumps were shut off and drag arms raised and the time the dredge reached the placement site and began to dump material.

#### ***From placement***

The actual time that is spent in running from the point at which loading was terminated to the placement site and return to the cut. When pumping out, this time will be the running time from the point at which loading was terminated to the time when the pumpout facility is reached and the return trip from the time the vessel leaves the pump-out facility until loading starts.

***Total cycle***

Total time for the dredging cycle, equal to the sum of the times of pumping the load, travelling from the cut to the placement site, dumping, and returning to the dredge cut.

***Pay place***

In situ quantity of material (in cubic yards) removed from within the project or pay prism (including allowable overdepth of the job assignment as determined from before and after dredging surveys).

***Pumping***

Conditions in which pumps used to recover sediment from the seabed are turned on and water and/or sediment is pulled through the drag arms. The term pumping is often used interchangeably with "actively dredging."

***Pumpout and hookup***

When disposal of the material in the hoppers is accomplished by pumping out, the actual time spent hooking up and unhooking and the time to discharge the load.

***Pumps - start/stop***

Time the dredging pumps were started at the beginning of a load, and stopped at the completion of a load, recorded to the nearest minute.

***Sidecast***

Material which upon being dredged is not retained, but instead is pumped overboard through a pipe mounted on a boom.

***Tide height***

Average tidal elevation in feet above mean lower low water during a load.

***Turning***

Actual time when dredge pumps were on but the pumps were not pumping material because of having to turn, "back" and "fill," or otherwise maneuver the dredge.

***Volume***

Volume of material calculated to be on the bottom within dredging area boundaries (prism), and/or is dredged and retained. In the case of hopper dredges, volume of material in the hopper. Volumes and volumes per minute typically recorded include:

***Average cubic yards per cycle minute***

Derived cubic yards divided by the total cycle time.

***Average cubic yards per pumping minute***

Derived cubic yards divided by the pumping minutes.

***Derived cubic yards***

From the volume of material retained in the hopper, an estimated volume of material as it lay on the bottom, *in situ*, is calculated. This estimated *in situ* volume is called derived cubic yards.

***Sidecast or agitated cubic yards***

When sidescasting, the total volume of material that passed through the pump and discharged through the sidescasting boom. This volume can be measured using the reading from a production meter, before and after surveys, or estimated based on historical performance at a specific location. When performing agitation dredging, the total volume in cubic yards, pumped overboard while engaged in agitation dredging.

***Yardage meter***

The yardage meter shows the estimated volume, in cubic yards, of material retained in the hopper based on the displacement or draft of the vessel and its known ship characteristics and hopper volume curves.

# **Appendix B**

## **Example Trip, Daily, and Job Reports**

---

Contract: Dredge Test			Date: 16-OCT-1992		
Project: Columbia River			Load Number: 17		
Dredge: Essaysons					
<b>Vessel Info</b>					
Start Time	X	Y	Heading (Deg)	Speed (Knots)	Draft Fwd Aft
07:24:55 AM	1401684	853894	163.0	4.8	16.2 23.7 Off
07:47:02 AM	1401992	854551	164.0	2.6	16.2 23.7 On
08:02:38 AM	1406312	851297	169.0	2.7	24.0 27.8 Off
08:06:54 AM	1406707	851151	314.0	1.5	24.0 28.2 On
09:03:20 AM	1402885	861579	350.0	2.5	30.1 31.9 On
09:12:49 AM	1402225	864292	327.0	2.7	29.9 31.6 Off
<b>Port Draghead Info</b>			<b>Stbd Draghead Info</b>		
Start Time	Drag Depth	Drag Elevation	Drag Pump	Drag Pump	Tide Height
07:24:55 AM	-3.7	-5.2 Off	-4.3	-5.8	1.5 To cut
07:47:02 AM	26.3	24.8 On	28.3	26.8	1.5 Pumping
08:02:38 AM	19.3	16.3 Off	21.2	18.2	3.0 Turning
08:06:54 AM	34.2	31.2 On	32.9	29.9	3.0 Pumping
09:03:20 AM	31.0	28.0 On	31.0	28.0	3.0 To dump
09:12:49 AM	-10.0	-13.0 Off	-10.0	-13.0	3.0 Dumping

Total Time	Description		
72.03	Pumping		
4.27	Turning		
9.48	To dump		
8.88	Dumping		
22.12	To cut		
0	Downtime		

Total Cycle Time	=	116.78
Tons Retained	=	7594.39
Tons Retained/Min	=	65.03

Figure B1. Example trip report

Contract: Dredge Test			Date: 14-OCT-1992								
Project: Columbia River			No of Loads: 5								
Dredge: Essayons											
Minutes											
Load	Pumping	Turning	To Dump	Dumping	To Cut	Other	Total Time	Load TDM	Dry Tonnage	Per Pump	Per Elaps
										Minute	Minute
1	0	0	0	3.01	0	2.00	5.01	0	0.0	0.0	0.0
2	62.25	0	29.68	9.68	18.26	0	119.88	6958.57	111.78	58.05	
3	80.08	0	26.47	10.67	17.88	0	135.10	7353.62	91.82	54.43	
4	65.22	3.77	23.90	7.18	17.25	0.17	117.48	6762.59	103.69	57.56	
5	88.37	0	31.23	16.65	20.10	0.17	156.52	6915.44	78.26	44.18	
Total	295.92	3.77	111.28	47.20	73.49	2.33	533.99	27990.21	385.56	214.22	
Average	59.18	0.75	22.26	9.44	14.70	0.47	106.80	5598.04	77.11	42.84	

Daily Report

Page 1 of 2

Figure B2. Example daily report (Continued)

Contract: Dredge Test	Date: 14-OCT-1992
Project: Columbia River	No of Loads: 5
Dredge: Essayons	
Minutes	
Load	
Pumping	Turning
To Dump	Dumping
To Cut	Other
Total Time	Load TDM
Per Pump	Dry Tonnage
Minute	Per Elaps
Minute	Minute
Time	
Downtime description	
0 To be defined 0 Taking on fuel and supplies 0 To or from wharf or anchorage 0 Loss due to opposing natural elements 0 Loss due to traffic and bridges 0 Minor operating repairs 0 Transfer between works 0 Lay time 0 Fire and boat drills 0 Miscellaneous 0 Major repairs and alterations 0 Cessation 0 Collisions	

Figure B2. (Concluded)

Contract: Dredge Test	Location: No Location																																																								
Project: Columbia River	Starting Date: 14-OCT-1992																																																								
Dredge: Essayons	Closing Date: 17-OCT-1992																																																								
<i><b>Work Performed</b></i>																																																									
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Figure B3 Example job report

# REPORT DOCUMENTATION PAGE

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<b>1.AGENCY USE ONLY (Leave blank)</b>		<b>2.REPORT DATE</b> October 1995	<b>3.REPORT TYPE AND DATES COVERED</b>
<b>4.TITLE AND SUBTITLE</b> Silent Inspector User's Manual		<b>5.FUNDING NUMBERS</b> Contract Number DACP39-92-D-0012	
<b>6.AUTHOR(S)</b> Jeffrey M. Cox, Paul Maresca, Andrea Jarvela			
<b>7.PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Evans-Hamilton, Inc., 731 N. Northlake Way, Suite 201, Seattle, WA 98103 AdaSoft, Inc., 8750-9 Cherry Lane, Laurel, MD 20707 Andrea Jarvela, 4642 1st Avenue NE, Seattle, WA 98105		<b>8.PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>9.SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> U.S. Army Engineer Waterways Experiment Station 3909 Halls Ferry Road Vicksburg, MS 39180-6199		<b>10.SPONSORING/MONITORING AGENCY REPORT NUMBER</b> Instruction Report DRP-95-2	
<b>11.SUPPLEMENTARY NOTES</b> Available from National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161.			
<b>12a.DISTRIBUTION/AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited.		<b>12b.DISTRIBUTION CODE</b>	
<b>13.ABSTRACT (Maximum 200 words)</b> This report describes use of the Silent Inspector (SI) system developed for monitoring hopper dredge operations. The system collects and records measurements from shipboard sensors, calculates the dredging activities being performed and the weight of the material recovered in tons dry measure, and displays this information through standard reports and graphical data displays. Recorded data are also automatically backed up, and later archived to allow transfer of the data to other locations, and to provide a permanent record of the dredging activity.			
<b>14.SUBJECT TERMS</b> Dredging Hopper dredges Silent Inspector (SI) system		<b>15.NUMBER OF PAGES</b> 118	
		<b>16.PRICE CODE</b>	
<b>17.SECURITY CLASSIFICATION OF REPORT</b> UNCLASSIFIED	<b>18.SECURITY CLASSIFICATION OF THIS PAGE</b> UNCLASSIFIED	<b>19.SECURITY CLASSIFICATION OF ABSTRACT</b>	<b>20.LIMITATION OF ABSTRACT</b>